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CATALOGUE  
OF THE  
COLLEGE OF NEW JERSEY  
PRINCETON

CXXXIX YEAR—1885-86.

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The Princeton Press.

1885.



Mr. H. H. H. H. H. H. H.

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*(continued)*

1. The first group of people who are not allowed to enter the country are those who are not citizens of the United States.

1. The first group of people who are not in the majority are those who are not in the majority of the population. This group is the largest and is the most diverse. It includes people of different ethnicities, religions, and social classes. This group is the most vulnerable to discrimination and oppression.

1991

1991

1128 12.10.1

4. The Commission has also been informed that the Government of India has been requested to provide information on the progress of the implementation of the recommendations of the Commission's report on the subject.

1. The first group of respondents (Group 1) consisted of 100 individuals who were randomly selected from the general population of the United States. This group was used to establish the baseline for the study.

1. The first of these is the fact that the

1. *Chlorophyll a* and *Chlorophyll b* were determined by the method of Lichtenthaler and Sponholz (1974). The total chlorophyll content was determined by the method of Arar and Cook (1980). The carotenoid content was determined by the method of Lichtenthaler and Sponholz (1974). The total carotenoid content was determined by the method of Arar and Cook (1980). The total protein content was determined by the method of Lowry (1956). The total lipid content was determined by the method of Bligh and Dyer (1959). The total carbohydrate content was determined by the method of Dubois and Gilles (1950). The total nucleic acid content was determined by the method of Burton (1956). The total ash content was determined by the method of AOAC (1990). The total moisture content was determined by the method of AOAC (1990). The total dry matter content was determined by the method of AOAC (1990). The total organic acid content was determined by the method of AOAC (1990). The total alkaloid content was determined by the method of AOAC (1990). The total flavonoid content was determined by the method of AOAC (1990). The total phenolic content was determined by the method of AOAC (1990). The total tannin content was determined by the method of AOAC (1990). The total saponin content was determined by the method of AOAC (1990). The total sterol content was determined by the method of AOAC (1990). The total glycoside content was determined by the method of AOAC (1990). The total alkaloid content was determined by the method of AOAC (1990). The total flavonoid content was determined by the method of AOAC (1990). The total phenolic content was determined by the method of AOAC (1990). The total tannin content was determined by the method of AOAC (1990). The total saponin content was determined by the method of AOAC (1990). The total sterol content was determined by the method of AOAC (1990). The total glycoside content was determined by the method of AOAC (1990).

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

1. The first group of people who are not in the labor force are those who are not in the labor force because they are not in the labor force.

7-11-68

...and the other side of the road.

22

... ..

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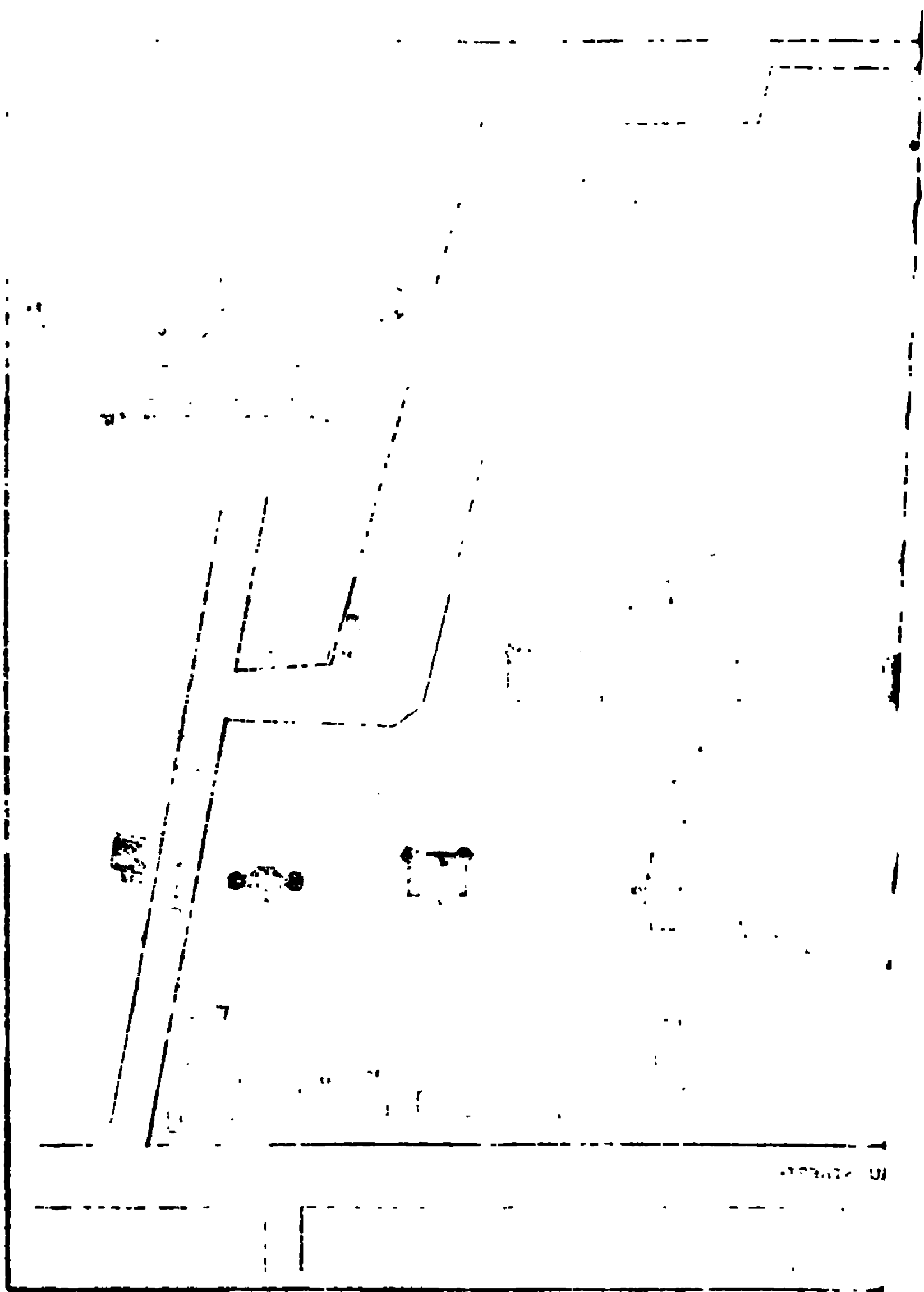
1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

*Journal of Management Education* 30(6)p. 789-804  
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1. The first step is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

1. **Introduction**

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CATALOGUE  
OF THE  
COLLEGE OF NEW JERSEY  
PRINCETON

394/412

CXXXIX YEAR -1885-86.

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The Princeton Press.

1885.





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## CALENDAR.

### 1885.

- Sept. 15—16.* Examinations for admission, in Princeton only.  
*Sept. 16.* First term begins—College assembles at 3 P. M.  
in Marquand Chapel.  
*Sept. 17.* Conditioned and unexamined students assemble  
in the Old Chapel at 10 A. M.  
*Nov. 12.* Stated Meeting of the Board of Trustees.  
*Nov. 25—30.* Thanksgiving Recess.  
*Dec. 1.* Second Term Electives chosen.  
*Dec. 14—23.* Examinations. End of first term.  
*Dec. 23—Jan. 6.* Christmas vacation.

### 1886.

- Jan. 6.* Second term begins.  
*Jan. 28.* Day of Prayer for Colleges.  
*Feb. 11.* Stated Meeting of the Board of Trustees.  
*Feb. 22.* Washington's birthday—Exercises in University  
Hall.  
*April 14.* End of second term.  
*April 14—21.* Spring vacation.  
*April 21.* Third term begins.  
*May 15.* Last day for renewing room agreements for '86-7.  
*May 26—June 5.* Senior final examinations.  
*June 5.* Annual allotment of rooms.  
*June 9—19.* Examinations of the three lower classes.  
*June 20.* Baccalaureate sermon.  
*June 21.* Class Day—Junior Orations, 7.30 P. M.  
*June 22.* Reading of Theses by Scientific students—An-  
nual Meetings of Literary Societies—Annual  
Meeting of Alumni Association—Lynde Prize  
Debate, 7.30 P. M.  
*June 23.* CXXXIX Annual Commencement.  
*June 21—23.* Commencement Meeting of the Board of Trustees.  
*June 24—25.* Examinations for admission, held simultane-  
ously in Princeton and Western cities.  
*June 25—Sept. 15.* Long vacation.  
*Sept. 14—15.* Examinations for admission, in Princeton only.

<i>Sept. 15.</i>	First term begins— College assemblies at 3 P. M. in Marquand Chapel.
<i>Sept. 16.</i>	Conditioned and unexamined students assemble in the Old Chapel at 10 A. M.
<i>Nov. 11.</i>	Stated Meeting of the Board of Trustees.
<i>Nov. 24—29.</i>	Thanksgiving Recess.
<i>Nov. 30.</i>	Second Term Electives chosen.
<i>Dec. 13—22.</i>	Examinations. End of first term.
<i>Dec. 22—Jan. 5.</i>	Christmas vacation.

1885.							1886.						
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Edward H. Rudd, <sup>3</sup>	Princeton,	Rahway, N. J.
Paul A. Scharff, <sup>1</sup>	Princeton,	Newark, N. J.
Edgar W. Russell, <sup>3</sup>	————	New York City.
James Simmons, Jr., <sup>3</sup>	Beloit,	Lake Geneva, Wis.
Naomi Tamura, <sup>1 3</sup>	Tokio School,	Tokio, Japan.
Henry D. Thompson, <sup>1 20 21</sup>	Princeton,	Princeton, N. J.
J. A. Thompson, <sup>1</sup>	Monmouth,	Dickson, Tenn.
W. M. Tufts, <sup>1</sup>	Dalhousie,	Halifax, N. S.
E. S. Wallace, <sup>1</sup>	Washington & Jefferson,	Alleghany, Pa.
Patterson Wardlaw, <sup>1</sup>	Erskine,	Abbeville, S. C.
William S. Watson, Jr., <sup>28</sup>	New York City,	New York City.
Albert M. West, <sup>1 3</sup>	W. Univ. of Pa.,	Pittsburgh, Pa.
J. H. Westcott, <sup>1 12</sup>	Princeton,	Philadelphia.
Chas. T. White, <sup>1</sup>	Williams,	Salem, N. Y.
B. F. Wilson, <sup>1</sup>	Davidson,	Mayesville, S. C.

Graduate Students . . . . . 58.

## GRADUATE COURSES.

## I. DEPARTMENT OF PHILOSOPHY.

1. *Discussions in Contemporary Philosophy*, THE PRESIDENT.
2. *Plato's Philosophy*, PROF. ORRIS.
3. *Ethics*, PROF. PATTON.
- [4. *Comparative Politics*, PROF. SLOANE.]
- [5. *Common Law*, PROF. JOHNSTON.]
- [6. *Greek Sculpture*, PROF. MARQUAND.]

## II. DEPARTMENT OF LITERATURE.

- [10. *Latin*, PROF. PACKARD.]
- [11. *Anglo-Saxon*, PROF. HUNT.]
12. *Sanskrit*, PROF. WINANS.

## III. DEPARTMENT OF SCIENCE.

20. *Differential Equations*, PROF. FINE.
21. *Higher Geometry*, PROF. FINE.
- [22. *Astronomy*, PROF. YOUNG.]
23. *Physics*, PROF. BRACKETT.
24. *Math. Physics*, PROF. MAGIE.
25. *Lab. Chemistry*, PROF. CORNWALL.
26. *Mineralogy*, PROF. CORNWALL.
27. *Biology*, PROF. MACLOSKEY.
28. *Histology*, PROF. LIBBEY.
29. *Palæontology and Embryology*, PROF. SCOTT.

NOTE.—The courses in brackets will be offered during the Second and Third Sessions.

## ACADEMIC DEPARTMENT.

## I. DEPARTMENT OF PHILOSOPHY.

1. *History of Philosophy and Psychology.* THE PRESIDENT.
2. *Ethics.* PROF. PATTON.
3. *Logic and Metaphysics.* PROF. ORMOND.
4. *Harmony of Science and Religion.* PROF. SHIELDS.
5. *History and Political Science.* PROF. SLOANE.
6. *Jurisprudence and Political Economy.* PROF. JOHNSTON.
7. *History of Art.* PROFS. PRIME AND MARQUAND.

## II. DEPARTMENT OF LANGUAGE AND LITERATURE.

1. *English.* PROFS. MURRAY, HUNT AND RAYMOND.
2. *Greek.* PROFS. CAMERON, ORRIS AND WINANS.
3. *Latin.* PROFS. PACKARD, WEST AND MR. WESTCOTT.
4. *French and German.* PROF. KARGÉ.
5. *Anglo-Saxon.* PROF. HUNT.
6. *Sanskrit.* PROF. WINANS.

## III. DEPARTMENT OF MATHEMATICS AND SCIENCE.

1. *Mathematics.* PROFS. DUFFIELD, FINE AND DR. CARMAN.
2. *Astronomy.* PROFS. YOUNG AND MCNEILL.
3. *Physics.* PROFS. BRACKETT AND MAGIE.
4. *Chemistry.* PROFS. SCHANCK, CORNWALL AND DR. McCAY.
5. *Biology.* PROFS. SCHANCK, MACLOSKIE, SCOTT, OSBORN, MR. PETERS AND MR. RANKIN.
6. *Botany.* PROF. MACLOSKIE.
7. *Histology.* PROF. LIBBEY.
8. *Physical Geography.* PROF. LIBBEY.
9. *Geology and Palæontology.* PROFS. SCOTT AND OSBORN.

## UNDERGRADUATES.

### SENIOR CLASS.

James Collins Adams,	Oakland, Cal.,	9 E M W H
Pearce Bailey,	Morristown, N. J.,	8 S R H
Joseph Deyoe Baucus,	Bacon Hill, N. Y.,	8 N R H
Grant Robinson Bennett,	Portage, Wis.,	Mr. Lavake's
Dan Denison Bickham,	Dayton, O.,	16 N W
Montgomery Blair, Jr.,	Washington, D. C.,	10 W M W H
Robert Bruce Bowie,	Baltimore, Md.,	18 & 19 S E H
James Harrington Boyd,	Wooster, O.,	Mrs. King's
Herbert Lamotte Brice,	Lima, O.,	8 W W H
John Calhoun,	Van Wert, O.,	17 & 20 S E H
Arnold Guyot Cameron,	Princeton, N. J.,	Prof. Cameron's
James Cochran Carter,	Boonton, N. J.,	21 N E H
Samuel Thompson Carter, Jr.,	Huntington, L. I.,	80 N E H
†John W. Cary, Jr.,	Milwaukee, Wis.,	Mrs. J. Burke's
John Reiff Cassel,	Cedars, Pa.,	Mr. Waibel's
†John Tyler Charlton,	Louisville, Ky.,	Mrs. Warren's
James Woodward Clark,	Indiana, Pa.,	D, U H
Horace Newton Congar, Jr.,	Newark, N. J.,	8 N R H
David Edgar Crozier,	Taylor's Falls, Minn.,	40 N E H
Charles M. DeCamp,	Pittsburgh, Pa.,	6 W M W H
Anthony Woodward Durell,	Pennington, N. J.,	18 S W
George A. Tryon Eddy,	Brockport, N. Y.,	20 N E
Wm. Simpson Elder,	Warsaw, O.,	14 N E H
Harry Charles Elsing,	South Evanston, Ill.,	39 S E H
Charles Rosenbury Erdman,	Springfield, Mass.,	1 E M W H

†Under Conditions.



# SENIORS:

19

Fred Evans, Jr.,	Philadelphia,	6 S R H
Frank Bateman Everitt,	Jamesburg, N. J.,	13 S M R H
Wilson Farrand,	Newark, N. J.,	36 S E H
Matthew Corry Fleming,	Xenia, O.,	1 E M W H
Joseph Holt Gaines,	Fayetteville, W. Va.,	10 W M W H
James Sproat Green, Jr.,	Elizabeth, N. J.,	B, U H
†Robert Stockton Green, Jr.,	Elizabeth, N. J.,	8 S R H
Wm. Alexander Guthrie,	Indiana, Pa.,	7 N W
Wm. D. Waples Hall,	Lewes, Del.,	1 S R H
R. T. Haines Halsey,	New Orleans, La.,	4 N R H
†Marshal Halstead,	Cincinnati, O.,	8 S W
†J. Arden Harriman,	New York City, The Red House	
Tracy Hyde Harris,	Hightstown, N. J.,	14 S W
Charles Elliott Hays,	Mifflin, Pa., Mrs. Stonaker's	
Charles Helliwell,	Princeton, N. J.,	27 N
Walter Lowrie Hervey,	Granville, O., Mr. Goldie's	
Harry Hillard,	Morristown, N. J.,	8 N R H
Hugh Lenox Hodge,	Hartford, Conn.,	7 N R H
Richard Morse Hodge,	Hartford, Conn.,	7 N R H
Wm. Herbert Hudnut,	Orange, N. J., Mr. Hudnut's	
Ottis Leander Jacobs,	York, Pa., Mrs. Burroughs'	
Charles Albert Jaggar,	Southampton, L. I.,	17 S M R H
Harry W. Jessup,	Scranton, Pa.,	9 N R H
William Jessup,	Montrose, Pa.,	9 N R H
Robert Crawford Johnston,	Holidaysburg, Pa., Mrs. Warren's	
Francis Fisher Kane,	Philadelphia,	G, U H
Wm. Dickey Kearns,	Pittsburgh, Pa.,	4 N M R H
Alford Kelley,	Baltimore, Md.,	25 N E H
Henry Cumming Lamar,	Augusta, Ga.,	13 W W H
Augustus Strong Mapes,	New York City,	24 N E H
John Cass Mathis,	Springfield, Ill.,	12 S E
John S. McAdam,	Newport, R. I.,	11 S W
George Brinton McClellan,	Orange, N. J., The Red House	
Sam'l John McClenaghan,	Kings Bridge, Pa., Mrs. Burroughs'	
John Wm. McKecknie,	Cincinnati, O.,	12 S E
Carroll McKenney,	Washington, D. C.,	20 W W H
Wm. Stevenson MacLaren,	Philadelphia,	18 N E
Harris Cornell Meserole,	Brooklyn, N. Y.,	14 S E

Edward Demoss Miller,	Gerrardstown, W. Va.,	18 N M R H
Marion Mills Miller,	Eaton, O.,	Miss Leigh's
David Meriwether Milton,	Louisville, Ky.,	7 E W H
Joseph Carroll Montanye,	Hatboro, Pa.,	1 S R H
John Alexander Montgomery,	Trenton, N. J.,	3 N R H
†Matthew Morgan,	New York City,	17 E W H
John Stevens Parker,	Princeton, N. J.,	Mr. Parker's
Stewart Paton,	New York City,	Mr. Goldie's
William Rankin,	Newark, N. J.,	20 N E
Joseph Pope Ranney,	Elizabeth, N. J.,	12 N E H
Taylor Reed,	Reedsville, Pa.,	17 N E
George Reynolds,	Orange, N. J.,	4 N R H
Edward Orth Robinson,	Allegheny, Pa.,	15 S E
George Black Roddy,	New Bloomfield, Pa.,	18 N
Richard Reid Rogers,	Mt. Sterling, Ky.,	19 W W H
George Lester Rundle,	Walpack Centre, N. J.,	1 N M R H
James Prestly Shaw,	Pittsburgh, Pa.,	8 S W
Ralph Crowley Sheldon,	Jamestown, N. Y.,	46 U H
John Archer Silver,	Deer Creek, Md.,	6 N W
Harry Brooks Smith,	Charleston, W. Va.,	Mrs. Warren's
Alexander Stewart, Jr.,	Chambersburg, Pa.,	6 N E
Charles Grimes Stoddard,	Dayton, O.,	2 E W H
Oliver Smith Strong,	Montclair, N. J.,	Miss Smith's
Llewellyn Thomas,	New York City,	9 E W H
Wm. Ferree Timlow,	Philadelphia,	6 N E
Robert Duncan Totten,	Pittsburgh, Pa.,	8 W M W H
Lewis H. Towler,	Corunna, Mich.,	U H
Charles Sloan Van Syckel,	Trenton, N. J.,	9 W W H
James A. Van Wagenen,	New York City,	Mr. Goldie's
John Milligen Waddell,	Princeton, Ill.,	Mrs. Priest's
†Albert Chandler Wall,	Hoboken, N. J.,	35 S E H
Lewis Rodman Wanamaker,	Philadelphia,	12 E W H
Gaylord Starin White,	New York City,	Mrs. Newton's
Robert Parmelee Wilder,	Princeton, N. J.,	Mr. Wilder's
Wm. Phelps Wood,	Trenton, N. J.,	5 N R H

SENIORS, . . . . . 98.

## JUNIOR CLASS.

John Erskine Adams,	Augusta, Ga.,	6 S E
Wilson Shaw Arbuthnot,	Pittsburgh, Pa.,	8 W M W H
George Titus Berry,	Caldwell, N. J.,	14 N E
Robert Wm. Blake,	Princeton, N. J.,	Mr. Blake's
Robert R. P. Bradford,	Dover, Del.,	4 E M W H
Stewart Brown,	New York City,	10 E W H
Charles Shepard Bryan,	New Berne, N. C.,	4 E M W H
Wilmot Albert Carrington,	Washington, D. C.,	14 S M R H
George McLean Cummings,	Baltimore, Md.,	10 N E H
John H. Denny,	Baltimore, Md.,	Mrs. Warren's
James Parker Dodd,	Newark, N. J.,	6 E M W H
Samuel Thompson Dodd,	Garfield, N. Y.,	5 S E
Wm. John Duane,	New York City,	2 W M W H
Herbert Elder,	Harrisburgh, Pa.,	35 N E H
John Wilson Elder,	Clarion, Pa.,	7 N W
Eugene Maurice Fitzgerald,	Washington, D. C.,	14 N W
William Holmes Forsyth,	Princeton, N. J.,	Mr. Forsyth's
Robert Gilchrist, Jr.,	Jersey City, N. J.,	20 E W H
Harry Lomison Goehring,	Irwin, Pa.,	18 U H
Edward Field Goltra,	Jacksonville, Ill.,	8 W W H
Wm. Thompson Graham,	Philadelphia, Pa.,	23 S E H
Adolph Gustave Greenberg,	Newark, N. J.,	5 S E
Clarence Halstead,	Cincinnati, O.,	7 S W
H. C. Heverin,	Philadelphia,	4 S R H
Robert James Hunt,	Trenton, N. J.,	Trenton
Solomon Stanger Iszard,	Glassboro, N. J.,	9 N E
John Martin Jamison,	Greensburg, Pa.,	17 & 20 S E H
Roger Bruce Cash Johnson,	Nassau, W. I.,	16 N E
Wm. Hallock Johnson,	New York City,	13 S E
C. P. F. Joyce,	Washington, D. C.,	15 W W H
George Armstrong Kelly, Jr.,	Pittsburgh, Pa.,	5 E M W H
Adrian Hoffman Larkin,	Sing Sing, N. Y.,	19 E W H
Mark Harvey Liddell,	Clearfield, Pa.,	8 S M R H
James Henry Lockhart,	Pittsburgh, Pa.,	5 S W
Charles Hill Macloskie,	Princeton, N. J.,	Prof. Macloskie's
Robert William Mason,	East Norwood, O.,	17 N

Paul Matthews,	Washington, D. C., Miss Smith's
Frank Keller McCance,	Allegheny City, Pa., 8 E M W H
Peter McHarg McQueen,	Gatehouse, Scotland, 19 N E
Albert Lincoln Mershon,	Princeton, N. J., Mrs. Mershon's
John Izard Middleton, Jr.,	Baltimore, Md., 18 W W H
Wm. Watts Montgomery, Jr.,	Augusta, Ga., 8 W W H
William Montgomery Nichol,	Indiana, Pa., 19 N E
Lyman Halter Nutting,	Lebanon, Pa., 5 N E
Gordon Paddock,	New York City, 7 W W H
James Paige,	Minneapolis, Minn., 32 N E H
Albert George Parker,	Oswego, N. Y., 26 N
Hamilton Parrish,	New York City, 15 N W
David Graham Phillips, Jr.,	Madison, Ind., 11 W W H
Horace Marshal Porter,	New York City, 7 N E
John Wahl Queen, Jr.,	Mount Pleasant, N. J., 9 N E
Frank Ellison Reid,	Urbana, O., 19 S E
George Livingstone Robinson,	West Hebron, N. Y., 16 N
James Henry Robinson,	Springfield, O., 30 S E H
Clarence William Rouse,	W. New Brighton, N. Y., 19 S W
Henry Seymour Savage,	Virginia, Ill., 8 E M W H
Alfred Hedges Scofield,	Budd's Lake, N. J., 25 N
George Beale Sloan, Jr.,	Oswego, N. Y., 20 E W H
Frank Hyatt Smith,	Detroit, Mich., Mrs. Hubbard's
Franklin Spencer Spalding,	Denver, Colo., 4 S E H
William Marvin Spalding,	Denver, Colo., 4 S E H
Louis Stearns,	New York City, 3 W M W H
Isaac Lanning Van Schoick,	Perrineville, N. J., 10 S R H
Lucien Waggener, Jr.,	Frankfort, Ky., Miss Smith's
Charles Hurlbut Whitaker,	Delta, Pa., Mrs. Easton's
Francis Harding White,	Washington, D. C., 10 S R H
Joseph White Williams,	Paterson, N. J., 24 S E H
Hallam Gregory Williamson,	Washington, D. C., 15 W W H

JUNIORS . . . . . 68

#### SOPHOMORE CLASS.

Robert Staunton Adams,	Brooklyn, N. Y., 9 W M W H
Horace Anderson,	Indianapolis, Ind., 19 S M R H

John W. Ballantine,	Hamden, N. Y.,	11	N	M	R	H
Frederick Griswold Beebe,	Port Byron, N. Y.,	37	S	E	H	
James Seguin de Benneville,	Philadelphia,	2	W	W	H	
Charles Newbold Black, Jr.,	New York City,	11	S	E		
Collins Pechin Bliss,	New York City,	Mrs. Newton's				
Edgar Sumner Bliss,	Philadelphia,	34	N	E	H	
David Dandie Brough,	Providence, R. I.,	8	N	M	R	H
Henry Irick Budd, Jr.,	Mt. Holly, N. J.,	10	S	E	H	
Ernest T. Carter,	Orange Valley, N. J.,	9	W	M	W	H
Russell Carter,	Montclair, N. J.,	13	S	W		
Charles Cumston Chadbourn,	Wilmington, N. C.,	18	E	W	H	
James Robb Church,	Washington, D. C.,	8	S	R	H	
Hector William Cowan,	Hobart, N. Y.,	11	N	M	R	H
Calvin Bradley Crafts,	Tallahassee, Fla.,		K	U	H	
Winthrop More Daniels,	Dayton, O.,		H	U	H	
Hugh Trowbridge Dobbins,	Calistoga, Cal.,	10	N	E		
William Ross Downing,	Peoria, Ill.,	33	S	E	H	
Frederick L. Drummond,	Newark, N. J.,	9	S	R	H	
Livingston Farrand,	Newark, N. J.,	26	S	E	H	
John Fieldhouse Fenton,	Trenton, N. J.,	8	S	E	H	
John Fraser, Jr.,	Philadelphia,	2	N	E	H	
Kemper Fullerton,	Georgetown, D. C.,	6	W	W	H	
James Diverty Godfrey,	Millville, N. J.,	12	N	W		
Robert Halstead,	Cincinnati, O.,	7	S	W		
Thomas Benton Hamilton,	Columbus, O.,		I	U	H	
James Hancock,	Philadelphia,	5	W	M	W	H
Osmund Howard Harvey,	Baltimore, Md.,	17	W	W	H	
Charles James Hatfield,	Pottstown, Pa.,	17	S	W		
Benjamin V. D. Hedges,	Chester, N. J.,	38	N	E	H	
E. Hicks Herrick,	New York City,	7	E	M	W	H
Samuel Colgate Hodge,	Hartford, Conn.,	7	N	R	H	
William Ledyard Hodge,	Washington, D. C.,	3	S	R	H	
Edwin Mortimer Hopkins,	Carmel, N. Y.,	41	N	E	H	
George Wallace Hutchinson,	Windsor, N. J.,	16	S	E	H	
William Mann Irvine,	Bedford, Pa.,	10	N	M	R	H
Charles Leonard Jones,	Allegheny City, Pa.,	7	S	M	R	H
Samuel King,	Washington, D. C.,	7	N	M	R	H

Robert Hutchinson Kirk,	Lancaster, Pa.,	4 S M R H
Frederick Jay Knox,	Bloomfield, N. J.,	13 S W
†Charles Williston McAlpin,	New York City,	12 W W H
Thomas Nesbitt McCarter, Jr.,	Newark, N. J.,	6 N M R H
Chas. F. Williams McClure,	Boston, Mass.,	5 W M W H
Robert Winters McGregor,	Dayton, O.,	H, U H
Porter Robert McMaster,	Greenwich, N. Y.,	13 N W
George Whitfield MacMillan,	Perrineville, N. J.,	42 N E H
John McMillan,	Pittston, Pa.,	19 S E
Howard McWilliams,	Brooklyn, N. Y.,	4 W W H
Richard Waln Meirs,	Hornerstown, N. J.,	7 S E
Ulysses Mercur, Jr.,	Towanda, Pa.,	8 E M W H
Andrew Harold Miller,	Philadelphia, Rogers & Van Zandt's	
Junius Spencer Morgan, Jr.,	New York City,	16 W W H
Archibald Robertson Osmer,	Franklin, Pa.,	12 N M R H
Thomas Marc Parrott,	Dayton, O.,	6 N R H
James Hammond Pershing,	Stauffer, Pa.,	16 S E
Thomas McClure Peters,	New York City,	61 U H
Daniel Walter Phelan,	Gillette, N. J.,	17 N E
†Celsus Pomerene,	Berlin, O.,	Mrs. King's
†Lister Pomerene,	Berlin, O.,	Mrs. King's
Luther Edmunds Price,	Cape May City, N. J.,	16 S W
William Cozens Price,	Cape May City, N. J.,	16 S W
Ralph Earl Prime, Jr.,	Yonkers, N. Y.,	15 N M R H
Evans Tulane Richardson,	Stanton, Tenn.,	18 S M R H
Elliott Verne Richardson,	Trenton, N. J.,	9 N E H
Jacob Riegel,	Philadelphia,	14 W W H
Theodore Kepner Rinehart,	Millerstown, Pa.,	11 S M R H
Peter Rioseco,	Philadelphia,	14 N M R H
William Courtland Robinson,	Delhi, N. Y.,	13 N W
Walter Willard Ross,	Hamilton, Mo.,	79 U H
William Henry Runyon,	Millington, N. J.,	16 S E
George E. Scott,	Newark, N. Y.,	2 N R H
Charles Alvin Smith,	Philadelphia,	12 N
Charles Sidney Smith,	Washington, D. C., Mr. Hudnut's	
J. W. Stedman,	Wilmington, N. C.,	1 W W H
William Emery Studdiford,	Trenton, N. J.,	5 S R H

# FRESHMEN.

25

Arthur Pemberton Sturges,	New York City,	8 E W H
James Frederick Talcott,	New York City,	7 E M W H
John Benton Thomas,	Princeton, N. J.,	Mr. Thomas'
Stephen G. Thomas,	Princeton, N. J.,	Mr. Thomas'
Chas. Williamson Van Dyke,	Cranbury, N. J.,	19 N W
George B. Westcott Van Dyke,	Cranbury, N. J.,	19 N W
Ellwood O. Wagenhurst,	Clifton, Pa.,	8 N M R H
Frank Allan Waterman,	Fulton, N. Y.,	17 S E
William Wisner White,	Summit, N. J.,	10 N E
Tennis Williamson,	Flatbush, L. I.,	64 & 65 U H
Walter Augustus Wyckoff,	Jullunder City, India,	19 S W
Edward Yeomans,	Orange, N. J.,	19 N E H

SOPHOMORES . . . . . 88

# FRESHMAN CLASS.

Maitland Alexander,	New York City,	10 S E
Jarvis Norris Atkinson,	Jersey City, N. J.,	Mrs. Priest's
William Patterson Atkinson,	Philadelphia,	15 S E H
Richmond Ogston Aulick,	Washington, D. C.,	1 U H
Andrew Banks,	Mifflin, Pa.,	1 S E H
Alf. Hamilton Barr,	Alexandria, Pa.,	18 N E H
Samuel McKean Bayard,	Germantown, Pa.,	20 N W
Eugene Walker Belknap,	Newburgh, N. Y.,	19 U H
James Clark Bennett, Jr.,	Cape May City, N. J.,	Mrs. Covert's
Edward Payson Berry,	Caldwell, N. J.,	14 N E
Frederick Black,	Black's Island, Pa.,	49 U H
Alex. Nixon Bodine,	Philadelphia,	18 E W
David Bovaird, Jr.,	Bradford, Pa.,	79 U H
William Coughlin Braislin,	Crosswicks, N. J.,	16 S E H
R. Desha Breckinridge,	Lexington, Ky.,	16 E W H
John Milton Brooks,	Cleveland, O.,	Mr. Thos. Brown's
J. Prentiss Browning,	Cooperstown, N. Y.,	Mrs. Patterson's
Arthur Audley Brownlee,	Indiana, Pa.,	89 N E H

C. Sheldon Carothers,	Carlisle, Pa.,	31 S E H
Frank Delaplaine Carpenter,	Wilmington, Del.,	20 U H
G. Herbert Carter,	Huntington, N. Y.,	26 N E H
Wm. S. Chase,	Akron, Ohio,	A, U H
Isaac Parker Coale,	Arch Spring, Pa.,	8 N E H
William Judson Cook,	Sheridan, N. Y.,	10 N M R H
†George Lyle Curtis,	Elmira, N. Y.,	38 N E H
James Dennis Denègre,	Frederick City, Md.,	11 N E
Harry Gurnee Drummond,	Newark, N. J.,	9 S R H
William Edward Durell,	Pennington, N. J.,	18 S W
David Linn Edsall,	Hamburg, N. J.,	5 U H
J. Seymour Emans,	Freedom Plains, N. Y.,	27 S E H
Llewellyn Stover Fulmer,	Philadelphia,	3 U H
Sidney Dale Furst,	Lock Haven, Pa.,	34 U H
James Oliver Gayley,	Philadelphia,	15 S E H
Joshua Brush Gesner,	Linden, N. J.,	21 S E H
Malbone Watson Graham,	Dubuque, Iowa,	62 U H
J. Charles Gray,	Washington, D. C.,	L, U H
Norman Grey,	Salem, N. J.,	25 S E
Alexander Reading Gulick,	Princeton, N. J.,	24 N
Thos. Hanlon, Jr.,	Pennington, N. J.,	Mrs. Priest's
Edward Ringwood Hewitt,	New York City,	11 & 2 U H
†James Hunter,	New York City,	5 S E H
William Sherman Jenney,	Syracuse, N. Y.,	34 S E H
Frank Snowden Katzenbach, Jr.,	Trenton, N. J.,	5 N R H
Victor Kauffmann,	Washington, D. C.,	49 U H
William Howard King,	Princeton, N. J.,	Mrs. King's
Furman Kueeland,	Brooklyn, N. Y.,	11 N E
Robert Henry Life,	Rye, N. Y.,	24 N
John Stevens Maxwell,	Ocala, Fla.,	20 U H
Alvin Carr McCord,	Minneapolis, Minn.,	41 S E H
†Wm. Herron McCulloch,	Peoria, Ill.,	P, U H
George Grenville Merrill,	New York City,	Mr. Goldie's
William Laing Merrill,	New York City,	Mr. Goldie's
Clarence Blair Mitchell,	Lakewood, N. J.,	75 & 76 U H
Lewis S. Mudge,	Princeton, N. J.,	Mr. Mudge's
Fred Neher,	Troy, N. Y.,	Mrs. Newton's

† On trial.



William M. Paxton, Jr.,	Princeton, N. J.,	14 E W H
John Van Ness Philip,	Washington, D. C.,	14 E W H
Clifford Chandler Pollison,	Waverly, N. J.,	17 N W
John Williams Proudfit,	Baltimore, Md.,	O, U H
Edward Watson Rand,	Baltimore, Md.,	86 N E H
Frederick Alonzo Remington,	Gt. Barrington, Mass.,	42 S E H
B. Norris Ricketts,	Washington, D. C.,	N, U H
Edmund Yard Robbins,	Asbury Park, N. J.,	16 N
Thomas M. Roe,	Reading, Pa.,	10 N R H
Philip Ashton Rollins,	Philadelphia,	17 U H
Thomas Henry Powers Sailer,	Philadelphia,	10 S M R H
William Hedges Scofield,	Budd's Lake, N. J.,	25 N
†Willard Blossom Segur,	Andover, Mass.,	7 N E H
Irenaeus Mayberry Shepherd,	Trenton, N. J.,	8 U H
J. Condit Smith,	Fredonia, N. Y.,	N, U H
William Walter Smith,	Elizabeth, N. J.,	17 N W
Robert Eliot Speer,	Huntingdon, Pa.,	7 S E H
Gormly J. Sproull,	Providence, R.I., Mrs. Anderson's	
Thomas Sproull,	Providence, R.I., Mrs. Anderson's	
James Frederick Stebbins,	Geneva, N. Y.,	28 S E H
John DeWitt Sterry,	New York City,	20 S E
Charles Wadhams Stevens,	New York City,	15 U H
Duncan Warren Taylor,	Princeton, N. J., Mrs. Taylor's	
Walter Cerré Taylor,	St. Louis, Mo.,	7 N E H
John Alvin Terhune,	Saddle River, N. J.,	87 N E H
Frederic Crosby Torrey,	Montclair, N. J.,	10 E M W H
C. F. Uebelacker,	Morristown, N. J.,	9 U H
C. Doremus VanWagenen, Jr.,	New York City, Mr. Goldie's	
Howard Crosby Warren,	Montclair, N. J.,	10 E M W H
Bertram Howard Waters,	Pittsburgh, Pa.,	68 U H
Stephen Kellogg Watts,	New York City,	14 U H
Lewis Wildman Wickham,	Norwalk, O.,	A, U H
†James Edwards Wyckoff,	Jullunder, India, Mr. Burroughs'	

SPECIAL STUDENTS.

NOT CANDIDATES FOR A DEGREE.

Fred Freeman Blossom, <sup>2</sup>	Peoria, Ill.,	2 S R H
Albert Russel Bryan, <sup>1</sup>	Glasgow, Ky.,	Mrs. Harvey's
H. Ward Ford, <sup>1</sup>	Morristown, N. J.,	4 U H
William James George, <sup>1</sup>	Scroggsfield, O.,	Mrs. Stonaker's
Alfred Sherman Hartz, <sup>1</sup>	Peoria, Ill.,	2 S E H
Henry Hatton McMahon, <sup>3</sup>	Cambridge, O.,	12 S M R H
John Preston Brown Perkins, <sup>1</sup>	Nashville, Tenn.,	Mrs. Lavake's
William L. Sidler, <sup>2</sup>	Danville, Pa.,	1 S M R H
Garret Voorhees Stryker, <sup>2</sup>	Rocky Hill, N. J.,	8 S E H
James Wilson Williams, <sup>1</sup>	Berwyn, Pa.,	15 S M R H
H. Joseph Woodward, <sup>2</sup>	Peoria, Ill.,	2 S R H

1. First Year of Course. 2. Second Year. 3. Third Year.

SPECIALS, . . . . . 11.

SUMMARY.

SENIORS, . . . . .	98
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T H E  
JOHN C. GREEN SCHOOL OF SCIENCE.

---

JAMES McCOSH, PRESIDENT, *Psychology*.

JAMES O. MURRAY, DEAN, *English Literature and Language*.

J. STILLWELL SCHANCK, *General Chemistry*.

CYRUS F. BRACKETT, *Physics*.

HENRY B. CORNWALL, *Analytical Chemistry and Mineralogy*.

GEORGE MACLOSKIE, *Botany, Zoölogy, Biblical Instruction*.

CHARLES McMILLAN, *Civil Engineering*.

CHARLES A. YOUNG, *Astronomy*.

CHARLES G. ROCKWOOD, JR., *Mathematics*.

THEODORE W. HUNT, *Rhetoric, English Language*.

GEORGE L. RAYMOND, *Oratory and Aesthetic Criticism*.

WILLIAM LIBBEY, JR., *Hypsometry, Meteorology, Histology*.

WILLIAM B. SCOTT, *Geology*.

HENRY F. OSBORN, *Comparative Anatomy*.

FREDERICK N. WILLSON, *Descriptive Geometry, Stereotomy, Drawing*.

ALEXANDER T. ORMOND, *Logic*.

ALEXANDER JOHNSTON, *Political Economy*.

HERMANN C. O. HUSS, *French, German*.

WILLIAM F. MAGIE, *Physics*.

H. S. S. SMITH, *Civil Engineering*.

MALCOLM McNEILL, *Practical Astronomy*.

LEROY W. McCAY, *Analytical Chemistry*.

JOHN E. PETERS, *Biology*.

WALTER M. RANKIN, *Biology*.

## UNDERGRADUATES.

## SENIOR CLASS.

I. Candidates for B. S. II. For C. E.

I. William Ballantyne,	Washington, D. C.,	E, U H
I. Joseph Cashman,	Watertown, Mass.,	20 N E H
II. Herbert Hugh Claxton,	Yonkers, N. Y.,	10 N
I. Bertric Egbert,	Franklin, Pa.,	6 S R H
II. Charles E. Griffith,	Lawrence, Kan.,	6 S W
II. Charles T. Day Halsey,	Newark, N. J.,	12 N E
II. David Elwood Harlan,	Churchville, Md.,	12 S W
II. Walter Butler Harris,	Princeton, N. J.,	Mrs. Harris's
I. John J. Lawrence, Jr.,	Pittsburgh, Pa.,	C, U H
I. Edward H. Pershing,	Pottsville, Pa.,	18 S E
I. George Edward Shea,	Pittsburgh, Pa.,	9 N W
II. Henry P. Toler,	Madison, N. J.,	12 N E
II. Henry Edgerton Vance,	Wheeling, W. Va.,	10 S W
I. Charles Whiting,	Ballston, N. Y.,	14 S E H
II. Samuel Renwick Wills,	Wilkinsburg, Pa.,	1 N R H
II. James Wilson Woodrow,	Chillicothe, O.,	9 S E
II. Frederic A. Young,	Princeton, N. J.,	Prof. Young's

SENIORS, . . . . . 17

## JUNIOR CLASS.

II. Frederick K. Alexander,	Monongahela City, Pa.,	5 S M R H
II. Thomas Francis Bedle,	Jersey City, N. J.,	10 W W H
II. Francis Ogden Blackwell,	New York City,	8 W M W H
I. †Charles Earle,	New York City, Mrs. Margerum's	
I. Frank Enos,	Brooklyn, N. Y.,	6 E M W H
I. David Greene,	Columbus, O.,	7 W M W H
II. Fredk. Wolcott Jackson, Jr.,	Newark, N. J.,	11 N W
I. George Pierson Jessup,	Oneida, N. Y.,	11 S W
I. William Larimer Jones,	Pittsburgh, Pa.,	11 E W H
I. Samuel Roseburg Kelly,	Pittsburgh, Pa.,	5 N M R H
I. James G. Ludlum,	Pompton, N. J.,	9 S M R H
I. A. H. Phillips,	Lawrenceville, N. J.,	12 S E H

†Under conditions.

# STUDENTS.

31

II. Clinton Levering Riggs,	Baltimore, Md.,	7 W M W H
II. David Frederick Walker, Jr.,	Salt Lake City, Utah,	5 N W
JUNIORS . . . . .		14

## SOPHOMORE CLASS.

I. Stephen Weart Blackwell,	Trenton, N. J.,	5 S R H
II. Wm. Jas. Jarard Bowman,	Trenton, N. J.,	9 S E H
I. Andrew Harris Clerk,	Jersey City, N. J.,	3 E W H
I. Homer E. Frazer,	Fowlersville, N. Y.,	2 N R H
I. Francis M. Frazer,	Newark, N. J.,	1 W M W H
II. John Calvin Graham, Jr.,	Selma, Ala.,	8 N E
II. Francis Henry,	Princeton, N. J.,	Mr. Henry's
II. Conrad Hewitt,	Trenton, N. J.,	5 N M R H
I. Thomas E. Inslee,	Newton, N. J.,	15 N E
I. Frank Jones King,	Pittsburgh, Pa.,	45 U H
II. Edward Heber McCleery,	Milton, Pa.,	6 W W H
I. Wm. B. McLean,	Shippensburg, Pa.,	15 S W
II. John Elliot Nicholson,	New York City,	16 U H
I. Ferris Sherman Thompson,	New York City,	15 E W H
I. Thornton Floyd Turner,	Englewood, N.J.,	Mrs. Ferguson's
SOPHOMORES . . . . .		15

## FRESHMAN CLASS.

II. Jason Rogers Barr,	Louisville, Ky.,	9 S W
II. Wm. Roscoe Bonsal,	Baltimore, Md.,	77 U H
I. †E. Shirley Borden,	Philadelphia,	48 U H
II. William Daniel Bratton,	Elkton, Md.,	F, U H
II. Frederick Joseph Church,	Hudson, N. Y.,	18 S E H
I. Byron S. Clarke,	Brooklyn, N. Y.,	69 U H
I. Alonzo Edw'd Conover, Jr.,	New York City,	20 S W
I. George Kerr Edwards,	Washington, D. C.,	O, U H
I. †W. Fleming Gilliland,	Gettysburg, Pa.,	60 U H
I. Theodore Granger Gordon,	Columbus, O.,	60 U H
II. George Louis Hall,	Bedford, Pa.,	M, U H
I. Thomas W. Hotchkiss, Jr.,	Elmira, N. Y.,	18 N E H
II. Paul Cazenove Lamar,	Augusta, Ga.,	Nassau Hotel
I. Robert Charles Lewis,	New York City,	44 U H

† On trial.

II. George Thebaud Maxwell, New York City,	41 U H
I. Thomas McKee McKee, Allegheny, Pa.,	42 U H
II. Chas. Jenkins Montgomery, Augusta, Ga.,	Mrs. Fine's
II. Joseph Chandler Morris, Jr., New Orleans, La.,	10 U H
I. William Boswell Mount, Philadelphia,	27 N E H
I. Thomas Clarence Noyes, Washington, D. C.,	50 U H
I. Cyrus Long Pershing, Pottsville, Pa.,	18 S E
I. John Eliot Shrady, New York City,	20 S W
I. Henry Dorr Sill, Cooperstown, N. Y.,	74 U H
II. Lewis Mudge Smith, Princeton, N. J.,	Mrs. Smith's
I. Francis Lansing Stebbins, Geneva, N. Y.,	20 S E H
II. Dean Thompson, Freehold, N. J.,	Mr. Burroughs'
I. March Gonzales Turner, Wilkes Barre, Pa.,	6 E W H
I. Perry Walton, Newark, N. J.,	28 N E H
I. †Arthur Dix Windsor, Titusville, Pa.,	12 U H
I. William Crayton Winton, Addison, N. Y.,	Mrs. Lane's
FRESHMEN, . . . . . 30	

## SPECIAL STUDENTS.

## NOT CANDIDATES FOR A DEGREE.

Samuel Mills Bevin,	Easthampton, Conn.,	14 S W
William R. Blakemore,	Louisville, Ky.,	10 N W
Joseph Gerald Branch,	Columbia, Tenn.,	Mrs. Lavake's
Daniel Webster Evans, Jr.,	Englewood, N. J.,	1 E W H
Arthur Daniel Forst,	Trenton, N. J.,	15 N E H
William Sampson C. Maxwell,	Brooklyn, N. Y.,	11 S E H
Wm. T. McMillan,	Perrineville, N. J.,	42 N E H
Forster Wingate Weeks,	Newark, N. J.,	1 W M W H
SPECIALS, . . . . . 8.		

## SUMMARY.

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SOPHOMORES, . . . . .	15
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**GENERAL SUMMARY.**


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FELLOWS . . . . .	7
GRADUATE STUDENTS . . . . .	58
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	500
NAMES REPEATED . . . . .	3
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	497

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**CLASSIFICATION BY RESIDENCE OF UNDER-GRADUATES.**


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NEW JERSEY.....	113	TENNESSEE.....	3
PENNSYLVANIA.....	96	CALIFORNIA.....	2
NEW YORK.....	84	COLORADO.....	2
OHIO.....	30	FLORIDA.....	2
DISTRICT OF COLUMBIA.....	21	INDIANA.....	2
MARYLAND.....	14	LOUISIANA.....	2
ILLINOIS.....	10	MICHIGAN.....	2
KENTUCKY.....	9	MISSOURI.....	2
GEORGIA.....	5	ALABAMA.....	1
MASSACHUSETTS.....	5	IOWA.....	1
CONNECTICUT.....	4	KANSAS.....	1
RHODE ISLAND.....	4	WISCONSIN.....	1
WEST VIRGINIA.....	4	UTAH.....	1
NORTH CAROLINA.....	3	WEST INDIES.....	1
DELAWARE.....	3	SCOTLAND.....	1
MINNESOTA.....	3	INDIA.....	2

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**ABBREVIATIONS.**


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N, Nassau Hall.	E W H, East Entry of Witherspoon Hall.
N E, North Entry of East College.	W W H, West Entry of Witherspoon Hall.
S E, South Entry of East College.	E M W H, East Middle Entry of Witherspoon Hall.
N W, North Entry of West College.	W M W H, West Middle Entry of Witherspoon Hall.
S W, South Entry of West College.	N E H, North Entry of Edwards Hall.
N R H, North Entry of Reunion Hall.	S E H, South Entry of Edwards Hall.
S R H, South Entry of Reunion Hall.	U H, University Hall.
N M R H, North Middle Entry of Reunion Hall.	
S M R H, South Middle Entry of Reunion Hall.	

## HONORS AND DEGREES CONFERRED.

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### DEGREES.

#### *Honorary Degrees Conferred June, 1885.*

LL.D.—Rev. John Hall, Chancellor of Univ. of New York,  
New York.

Hon. Edward N. Dickerson, New York.

D.D. —Rev. John S. Sands, Pennsylvania.

Ph. D.—Rev. Henry Reeves, Class of '44, New Jersey.

Alexander Porter Morse, Class of '62, D. C.

Arthur H. Cutler, A. M., New York.

Sc. D.—Franklin C. Hill, Curator of E. M. Museum, Princeton.

John Sterling Kingsley, A. M., Massachusetts.

A. M.—Robert Sewell, New York.

#### *Degrees in Course.*

Sc. D.—Albert P. Carman, Class of '83.

F. A. C. Perrine, Class of '88.

Master of Arts . . . . .	51
Bachelor of Arts . . . . .	94
Master of Science . . . . .	2
Bachelor of Science . . . . .	3
Civil Engineer . . . . .	6

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### HONORS 1884-5.

#### COMMENCEMENT HONORS.

#### MASTER'S ORATION.

John Grier Hibben, Illinois.



## ORATIONS AT GRADUATION.

*The Latin Salutatory.*

William Brown McIlvaine, Illinois.

*The Valedictory.*

Clarence Walworth McIlvaine, Vermont.

*The English Salutatory.*

James Wilson Bayard, Pennsylvania.

*The Philosophical Oration.*

James Harlan Cleveland, Kentucky.

*Honorary Orations and Theses.*

With special excellence in particular departments indicated.

Jonathan Sturges.	<i>English Literature.</i>
George Britton Durell.	<i>Experimental Science.</i>
Max Brunswick Nahm.	<i>Political Science.</i>
John Edgar Johnson, Jr.	<i>Chemistry.</i>
Sanford Norris Knapp.	<i>Astronomy.</i>
Charles Flint McClumpha.	<i>Philosophy.</i>
Sherrerd Depue.	<i>Constitutional Law.</i>
Robert Eber Carter.	<i>Biology.</i>
Reuben S. Lawrence.	<i>General Excellence.</i>
Henry Dallas Thompson.	<i>Mathematics.</i>
{ Robert H. Beattie.	<i>Mental Science.</i>
{ James Edward Hayes.	<i>Metaphysics.</i>
Frank Stiles Woodruff.	<i>General Excellence.</i>
George E. Swartz.	
Duncan Edwards.	
John Haughton Coney.	
Samuel McCrea Brann.	
Frank Strong Dunshee.	
Eugene Calvin Coulter.	
William Henry Lynch.	

## COLLEGE OF NEW JERSEY.

S. Harper Leeper, Jr.  
James Robert Hughes.  
Charles Rhodes Knox.  
William Fessenden Jackson.  
Malvern Nicholas Due.  
Robert Meade Parker.

## FELLOWS.

## IN MENTAL SCIENCE.

James Harlan Cleveland, Kentucky.

## IN CLASSICS.

Monroe Crawford, New Jersey.

## IN EXPERIMENTAL SCIENCE.

George B. Durell, New Jersey.

## IN MATHEMATICS.

Henry D. Thompson, California.

## IN MODERN LANGUAGES.

Paul A. Scharff, New Jersey.

## IN HISTORY.

James W. Bayard, Pennsylvania.

## IN BIOLOGY.

Robert E. Carter, New York.

## SENIOR PRIZEMEN.

## CLASS OF 1859 PRIZE IN ENGLISH LITERATURE.

Clarence W. McIlvaine, Vermont.

## IN SCIENCE AND RELIGION.

Frank S. Woodruff, New Jersey.

## THE GEORGE POTTS BIBLE PRIZE.

R. S. Lawrence, Kansas.

John C. Lord, New Jersey.

William H. Robinson, New York.

## THE LYMAN H. ATWATER PRIZE IN POLITICAL SCIENCE.

Sherrerd Depue, New Jersey.

## LYNDE PRIZE DEBATE.

Edmund Wilson, N. J., *First Prize*.

Sherrerd Depue, N. J., *Second Prize*.

Monroe Crawford, N. J., *Third Prize*.

## DEBATERS.

*American Whig Society.*

James H. Cleveland, Ky.

Monroe Crawford, N. J.

Edmund Wilson, N. J.

*Clisophic Society.*

Sherrerd Depue, N. J.

C. F. McClumpha, N. Y.

C. W. McIlvaine, Vt.

## BAIRD PRIZEMEN.

The Baird Prize.—Charles F. McClumpha, New York.

In Oratory. James H. Cleveland, Kentucky.

In Delivery. William H. Robinson, New York.

In Poetry. Frank S. Woodruff, New Jersey.

In Disputation. Sherrerd Depue, New Jersey, *1st Prize*.

James W. Bayard Pennsylvania, *2d Prize*.

*Competitors appointed for Excellence in English Composition :*

*For Baird Prize and Prize for Oratory*—J. H. Cleveland, C. F. McClumpha, C. W. McIlvaine, W. B. McIlvaine, M. B. Nahm, J. Sturges ; *For Prize for Oratory*—J. W. Bayard, R. H. Beattie, R. E. Carter, J. H. Coney, S. Depue, M. N. Due, S. N. Knapp, C. R. Knox, R. S. Lawrence, E. Wilson, F. H. Wilson, F. S. Woodruff.

**JUNIOR PRIZEMEN.***Junior First Honor Scholar.*

George Black Roddy, Pa.

*Dickinson Prizeman.*

E. D. Miller, W. Va.

A. G. Cameron, N. J., *Honorable Mention.**Maclean Prizeman.*

Marion M. Miller, Ohio.

*Junior Orator Medalists.*Charles R. Erdman, N. Y., *First Medal.*Marion M. Miller, O., *Second Medal.*William Jessup, Pa., *Third Medal.*William Rankin, N. J., *Fourth Medal.**Competing Junior Orators.**American Whig Society.*

Charles R. Erdman, N. Y.

John W. Harding, Pa.

William Jessup, Pa.

Marion M. Miller, O.

*Clisophic Society.*

Anthony W. Durell, N. J.

George T. Eddy, N. Y.

Wilson Farrand, N. J.

William Rankin, N. J.

**SOPHOMORE PRIZEMAN.***Class of 1861 Prize.*

Samuel T. Dodd, N. Y.

Frank E. Reid, O., *Honorable Mention.***FRESHMAN PRIZE.***Freshman First Honor Prize.*

Winthrop More Daniels, Ohio.

## JUNIOR HONORMEN.

*First Group.*

G. A. T. Eddy, N. Y.	G. B. Roddy, Pa.
M. C. Fleming, O.	R. C. Sheldon, N. Y.

*Second Group.*

J. D. Baucus, N. Y.	W. L. Hervey, O.
J. H. Boyd, O.	J. W. McKecknie, O.
A. G. Cameron, N. J.	H. C. Meserole, N. Y.
J. W. Cary, Jr., Wis.	E. D. Miller, W. Va.
H. C. Elsing, Ill.	M. M. Miller, O.
C. R. Erdman, N. Y.	J. A. Silver, Md.
Fred Evans, Jr., Pa.	J. M. Waddell, Ill.
J. W. Harding, Pa.	

## JUNIOR HONORMEN, SCHOOL OF SCIENCE.

## B. S. COURSE.

I. Edward H. Pershing, Pa.

## C. E. COURSE.

I. Herbert H. Claxton, N. Y.

## SOPHOMORE HONORMEN.

*First Group.*

W. R. Johnson, N. Y., Dr. Chapin's Coll. School, N. Y.

*Second Group.*

R. W. Blake, N. J.,	John D. Blake, A.B.
W. A. Carrington, D. C.,	Columb. Univ., Washington, D. C.
R. B. C. Johnson, W. I.,	Pennington Seminary, N. J.
C. H. Macloskie, N. J.,	Professor Macloskie.
Paul Matthews, D. C.,	St. Paul's Sch., Concord, N. H.
P. M. McQueen, Scotland,	Clinton Grammar Sch., N. Y.
James Paige, Minn.,	Phillips Acad., Andover, Mass.
J. W. Queen, Jr., N. J.,	State Model Sch., Trenton, N. J.
F. E. Reid, O.,	Urbana, O., High School and Cooper Acad., Dayton, O.
A. H. Scofield, N. J.,	Rev. C. J. Collins and Williston Seminary.
F. H. Smith, Mich.,	Clinton Grammar Sch., N. Y.

**SOPHOMORE HONORMAN, SCHOOL OF SCIENCE.****B. S. COURSE.**

**I. A. H. Phillips, N. J.,**      Lawrenceville School.

**FRESHMAN HONORMEN.***First Group.*

**Winthrop More Daniels,**      Deaver Coll. Institute, Dayton, O.

*Second Group.*

<b>H. E. T. Carter, N. J.,</b>	<b>Sedgwick Inst., Gt. Barrington, Mass.</b>
<b>H. T. Dobbins, Cal.,</b>	<b>City College, James Matthews, Principal.</b>
<b>F. D. Drummond, N. J.,</b>	<b>Newark Acad., Newark, N. J.</b>
<b>Livingston Farrand, N. J.,</b>	<b>Newark Acad., Newark, N. J.</b>
<b>Kemper Fullerton, D. C.,</b>	<b>Erie Acad., Erie, Pa.</b>
<b>E. M. Hopkins, N. Y.,</b>	<b>Albany State Normal School.</b>
<b>W. M. Irvine, Pa.,</b>	<b>Phillips' Exeter Acad.</b>
<b>F. J. Knox, N. J.,</b>	<b>Lawrenceville School.</b>
<b>T. M. Parrott, O.,</b>	<b>Morris Acad., Morristown, N. J.</b>
<b>E. T. Richardson, Tenn.,</b>	<b>S.W.P. Univ., Clarksville, Tenn.</b>
<b>W. H. Runyon, N. J.,</b>	<b>Bedminster Classical School, Bedminster, N. J.</b>
<b>C. S. Smith, D. C.,</b>	<b>Ritterhouse Acad., Wash., D. C.</b>
<b>J. F. Talcott, N. Y.,</b>	<b>Lyon's Coll. Inst., N. Y. City.</b>
<b>W. W. White, N. J.,</b>	<b>Morris Acad., Morristown, N. J.</b>

**FRESHMAN HONORMEN, SCHOOL OF SCIENCE.**

**I. W. W. Harts, Ill.,**      High School, Springfield, Ill.  
**I. E. H. McCleery, Pa.,**      Lawrenceville School.

# ACADEMIC DEPARTMENT.

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## ADMISSION.

### ENTRANCE EXAMINATIONS.

All entering students on their arrival must report at the President's house and register. Examinations for admission will be written, with supplementary oral examinations as needed. The first examination will commence in Princeton on Thursday, June 24th, at 11 A. M., and will continue through the afternoon of Friday. The second will commence on Tuesday, September 14th, at 11 A. M., and continue through the afternoon of Wednesday. Applicants who have any conditions or other deficiencies from the June examination are required to remove them at this time. *Attendance is required at the beginning of the examination.*

Simultaneously with the June entrance examinations in Princeton, examinations will also be held in the following cities, viz.: Pittsburgh, Cincinnati, Louisville, Chicago, St. Louis, Omaha, San Francisco; and at preparatory schools and other cities when necessary. The precise places in which the examinations are to be held can be learned by application to the President. Due notice of these examinations will also be published in leading local newspapers for several weeks in advance.

Examinations at other times and places than those specified are inconvenient, and often impracticable, and applicants for admission at other than the regular days are required to pay \$10 into the treasury.

### SUBJECTS.

Candidates for admission to the Freshman Class are examined in the following books and subjects. It is recommended that the candidates be prepared for examination on the requirements as specified; but equivalents will be accepted.

### English.

English Grammar—Whitney, or Reed and Kellogg (Higher Lessons); Modern Geography—Guyot's Grammar-School Geography; U. S. History—Anderson's or Johnston's.

The writing of a short essay is required as a part of the examination: the theme for the essay of 1886 will be based on the life of Irving or of Goldsmith.

The attention of Preparatory Schools is called to the need of a more thorough study of elementary English.

### Latin.

Latin Grammar: especially the inflections; the simple rules for composition and derivation of words; syntax of cases and verbs and structure of the sentence in general, with particular regard to relative and conditional sentences, Indirect Discourse, and the Subjunctive; so much prosody as relates to accent, quantity, versification in general, and Dactylic hexameter. Cæsar (five books of the Commentaries); Sallust (Catiline or Jugurtha); Virgil (six books of *Æneid*); Cicero's Select Oration (six); Arnold's Latin Prose Composition (twelve chapters). or Jones' Exercises in Latin Prose. Geography of Ancient Italy.

### Greek.

Greek Grammar, including Prosody; Xenophon (four books of the *Anabasis*), or Greek Reader (Goodwin's) 111 pages; Homer (the first two books of the *Iliad*, except the Catalogue of Ships); Greek Composition (Jones' Exercises in Greek Prose, or an equivalent—writing with the accents required); Geography of Ancient Greece and Asia Minor. Goodwin's Grammar is preferred. Special stress is laid upon a thorough knowledge of the noun and verb inflections. Candidates will do well to read an additional book of the *Iliad*, where this can be done without sacrifice of thoroughness in the formal requisitions. Some experience in giving written answers to set questions is advantageous.

The Continental pronunciation of the vowels and diphthongs is preferred in both Latin and Greek.



**Mathematics.**

Arithmetic, and the Metric System; Algebra, through Quadratic Equations involving two unknown quantities—including Radicals, and Fractional and Negative Exponents; Geometry, the first and second books of Euclid, or an equivalent—that is, the propositions in other text-books relating to the straight line and rectilinear figures, not involving Ratio and Proportion.

**PRELIMINARY EXAMINATIONS.**

At the examination in June, candidates intending to enter the Freshman Class one year later are admitted, on request, to examination on a portion of the subjects required for entrance. Of the four general subjects, English, Mathematics, Latin, Greek, two subjects may be offered entire; or such parts of at least three subjects as are here prescribed: viz. in *English*, Grammar and Geography; in *Mathematics*, Arithmetic, with the Metric System, and either Algebra, through simple equations of two unknown quantities, or the first and second books of Euclid; in *Latin*, the full amount in Cæsar and one other author, with Grammar; in *Greek*, three books of the Anabasis, with Grammar.

In both Latin and Greek Grammar the examination will be upon noun and verb inflections, syntax of nouns and the simpler rules of syntax of verbs. This examination will be partial only, to be completed the following year.

Applications for preliminary examinations should be made to the President, with a statement of the subjects and amount offered, at least two weeks previous to the examination.

**OTHER REQUIREMENTS.**

Candidates for admission to any class higher than the Freshman are examined in the previous studies of the Class which they wish to enter, or their equivalents, as published in the last annual Catalogue. Applicants for admission to the Sophomore Class are also examined in the preparatory studies. Applicants for admission to the Junior or Senior Class, *coming*

*from another College*, are examined only in the studies of the year preceding that which they wish to enter. While it is important that the applicants should have studied French, Elementary Anatomy and Physiology, an examination in these studies is not required.

No person is admitted to the College as a candidate for the degree of Bachelor of Arts, after the beginning of the first term of the Senior year.

All candidates for admission to any Class, or as special students, must bring with them testimonials of moral character and attainments, preferably from their last instructors; and if the candidate has been a member of another College or University, he must produce a certificate from its President or Faculty that he is free from censure in that institution.

No candidate is admitted into the College without examination and a vote of the Faculty.

Immediately after the opening of the College the entering students meet according to announcement for the registration of their names and subscription to the following pledge, required by the Board of Trustees :

We, the undersigned, do individually for ourselves promise, without any mental reservation, that we will have no connection whatever with any secret society, nor be present at the meetings of any secret society in this or any other College so long as we are members of the College of New Jersey; it being understood that this promise has no reference to the American Whig and Clissophic Societies. We also declare that we regard ourselves bound to keep this promise, and on no account whatever to violate it.

#### ADMISSION TO SPECIAL COURSES.

In exceptional cases, undergraduate students, not members of any one of the four regular classes nor candidates for a degree, are admitted to the privileges of the College, and allowed to take special courses, selected under the direction of the Faculty, in such a manner as to secure full and profitable employment of their time. Such special students undergo a preliminary examination sufficient to ascertain their preparation for the course proposed, and are subject to the same regulations and discipline and to the same examinations in the studies pursued, as other

undergraduates. On completing their course they receive certificates of proficiency. These special courses, however, are not offered to those who have failed in the regular course.

## COURSE OF STUDY.

The course for the degree of Bachelor of Arts extends through four Academic years and embraces instruction in the three departments of Philosophy, Language and Literature, Mathematics and Natural Science.

It includes two classes of studies, the required and the elective. The required studies are regarded as fundamental and essential in a liberal education, and therefore are not left to the student's option. The elective studies, though important, are not all indispensable, and accordingly are left, within definite limits, to the student's choice. Attendance is obligatory upon all electives, when once chosen, as well as upon all required studies. In connection with some departments there are also optional courses, with voluntary attendance.

All the studies of Freshman and Sophomore years are required, and include History, Greek, Latin, Modern Languages, Rhetoric and English Language, Mathematics and Natural History.

From the opening of Junior year onward the student, by availing himself of the elective system, may to a certain extent shape his course with reference to his individual tastes and the profession which he has in view. About two-thirds of the schedule time in this year is given to the required studies, which are Psychology and Logic, English Literature, Physics and Oratory. In addition to this, students are required to pursue three elective studies, to be selected from the following: Philosophy of History, Greek, Latin, Modern Languages (French and German), Anglo-Saxon, Mathematics, Physical Geography.

In Senior year the range of electives is wider, required studies occupying less than two-thirds of the time. The required studies are Science and Religion, Ethics, Jurisprudence and Political Economy; Astronomy, Chemistry, Geology; Eng-

lish (Essays) and Oratory. The Senior electives are offered in three groups to assist the choice of students who desire to concentrate their elective work in the Department of Philosophy, or of Literature, or of Science, but no student is required to restrict his choice to any group. The Seniors take either six or seven hours a week elective work, making their election from the following list: *In Philosophy*—History of Philosophy, Metaphysics, Science and Religion, Comparative Politics, International and Constitutional Law, Physiological Psychology, History of Art; *In Literature*—English Literature, Greek, Latin, French, German, Sanskrit; *In Science*—Mathematics, Practical Astronomy, Physics, Applied Chemistry, Laboratory Chemistry, Biology or Palæontology, Histology.

Students are required to choose their electives for the first term at the beginning of that term, and no changes will be allowed after the close of the third week, and none before that time, except for special reasons approved by the Faculty.

Students are required to hand in writing to the Registrar on or before the first Monday in December their choice of electives for the ensuing second and third terms, and no changes will be allowed after that date, except for special reasons approved by the Faculty.

No student whose rank in any department at the close of a year (or term) is in the Sixth Group\* shall have the privilege of electing that department in the succeeding year (or term) without special permission from the Faculty.

Optional courses, so ordered as not to conflict with the time allotted to the regular instruction of the course, are offered in connection with several departments. These courses are designed to benefit those who wish to extend their reading or study in certain branches; they amplify the subjects taken up in the regular course, and in some cases conclude with a special examination upon which is based a certificate of proficiency.

The Freshman class recites in divisions constituted according to rank in order to proportion the work to individual ability; rapid progress can thus be made by those who have special

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\* Vid., p. 88.

aptitudes for certain studies. In awarding the Bachelor's degree and assigning the final rank, the student's work for the whole four years is taken into account.

The following is a statement of the various courses of instruction in the three academic departments :

### DEPARTMENT OF PHILOSOPHY.

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Mrs. Robert L. Stuart, of New York, has recently given to the College one hundred and fifty-four thousand dollars, to maintain professorships in this department, embracing Ethics, Logic, Metaphysics, History of Philosophy and Psychology. She gives this in memory of her late husband, Mr. Robert L. Stuart, and of his brother, the late Mr. Alexander Stuart.

The professorships now established on this foundation are those of Psychology and The History of Philosophy, held by the President; of Ethics, by Professor Patton, and of Mental Science and Logic, by Professor Ormond.

Besides the undergraduate courses given below, the Department also embraces the courses on Contemporary Philosophy and on Plato, mentioned in connection with the graduate courses.

#### Psychology.

##### THE PRESIDENT.

In the first half of Junior year the whole Class is required to take the President's course in Psychology, consisting of lectures and recitations. He begins, as an introduction to the whole department, with explaining the method to be pursued, which is Induction, with Self-Consciousness as the agent of observation. In the first term he uses his text-book on "The Senses External and Internal." In a course of lectures running through half the year he unfolds the nature, the operations and laws of the faculties of the mind. I. THE COGNITIVE POWERS :

1. The Simple Cognitive or Presentative; Sense Perception and Self-Consciousness; 2. The Reproductive or Representative; Retention, Phantasy, Association, the Recognitive (Memory), Composition (Imagination), Symbolic (Language); 3. The Comparative; discovering Relations of Identity, Comprehension (whole and parts), Resemblance, Space, Time, Quantity, Active Property, Cause and Effect. II. THE MOTIVE POWERS: 1. The Conscience; 2. The Emotions; 3. The Will.

### **Physiological Psychology.**

THE PRESIDENT, PROFESSORS OSBORN AND SCOTT.

The President begins this elective course, which runs through the first term, and is attended by the Seniors, by showing in opposition to Materialism that we have a means of knowing mind by self-consciousness just as we have a means of knowing matter by the senses, and that the two possess essentially different properties, while they are closely connected with each other. Professor Osborn continues with lectures upon the physical structure of the nervous system, including the histology of the nerves and nerve cells, together with an account of the sense organs, of the principal nerve tracts in the spinal cord and brain, the larger internal divisions and the convolutions of the brain. Professor Scott concludes the course with a series of lectures upon the physiology of the nervous system, including the general problems of the origin and transmission of nervous force and the functions of the peripheral nerves, the spinal cord and the brain. Special attention is given to the localization of function in the cerebral cortex. Simple anatomical demonstrations accompany the course.

### **Metaphysics.**

PROFESSOR ORMOND.

Metaphysics is a two hour elective during the first term of Senior year. The instruction embraces lectures, recitations and

collateral reading. The subject is divided into two parts : (1) Gnosiology, in which the nature and limits of knowledge and its relation to First Truths are the main topics considered : (2) Ontology, in which the results of the first part are applied in the discussion of vital questions in Psychology, Cosmology and Theism.

### **History of Philosophy.**

#### **THE PRESIDENT.**

This is an elective course in the Senior year conducted by the President. Lectures are delivered twice a week throughout the second and third terms. It discusses : I. The ancient Greek and Roman Philosophies, including the Pre-Socratic Schools; Socrates, Plato and Aristotle ; and the Academic, Peripatetic, Epicurean and Stoic Sects. Mayor's "Ancient Philosophy from Thales to Cicero" is used as a text-book. II. Modern Philosophy from Bacon to the present time is taught by lectures with recitations, and embraces Bacon, Descartes, Locke, Leibnitz, Berkeley, Hume, Reid, Kant, Hamilton, and others.

### **Science and Religion.**

#### **PROFESSOR SHIELDS.**

Instruction in the Harmony of Science and Religion extends through the second and third terms of the Senior year, and includes both a required and an elective course. The required course embraces (1) the harmony of the physical sciences with natural theology ; the Divine Being and attributes as illustrated by astronomy, geology and anthropology ; (2) the harmony of the mental sciences with natural religion ; the doctrine of a future life, divine government and probation as reconcilable with physical, ethical and metaphysical theories ; (3) the harmony of science with revealed religion ; the miraculous, prophetic, historical, and philosophical evidences of Christianity, and its consistency with the whole system of the physical and psychical sciences.

The elective course embraces the study of the sciences as connected with revealed religion; their history, classification and methods; normal and existing relations of reason and revelation; emerging religious controversies in the different sciences, the problem of their adjustment, and the issuing philosophical system.

While the required course aims to present the essential Christian evidences as usually taught in Colleges, the elective course may also have the incidental effect of promoting that sound, ultimate philosophy which results from the harmony of science and revelation and looks forward to the gradual purification and completion of human knowledge.

In the elective course the instruction is given entirely by lectures. In the required course Butler's Analogy is used as a text-book, with occasional lectures, and monthly reviews and extemporaneous essays take the place of a final examination.

### **Logic.**

PROFESSOR ORMOND.

Logic is required in the last half of Junior year. (1) Formal Logic—comprising the Laws of Discursive Thought in Notions, Judgments and Reasonings. The Syllogism and other forms of reasoning will be discussed. Text-book, McCosh's Manual of Logic. Text-book instruction will be accompanied by lectures and practical exercises. (2) Applied Logic—Treating of Logical Method, Induction, Deduction, Demonstration, the Canons of Investigation and kindred topics. Taught by lecture and practical exercises with references for collateral reading.

### **Ethics.**

PROFESSOR PATTON.

This is one of the required studies of the Senior year. Two hours a week are devoted to it during the first term and one hour during the second term. Instruction is given by lectures accompanied by the use of Calderwood's Handbook of Moral Philoso-



phy as a text-book. The lectures deal with both Theoretical and Practical Ethics and embrace such topics as the Foundation of Moral Obligation, the Will, Conscience, the Nature of Virtue, and the Moral Law. Special attention is given to recent ethical discussions, and portions of representative ethical treatises are recommended for collateral reading.

A graduate course in the History of English Ethics will be offered next year.

### **Philosophy of History and Political Science.**

PROFESSOR SLOANE.

I. *Sophomore Class.* Two exercises a week throughout the first term, required. Outlines of Universal History. Freeman's General Sketch of History is used as a text-book. Lectures, narratives, and discussions are introduced as occasion requires.

II. *Junior Class.* Two exercises a week throughout the year, elective. Lectures and recitations on Transitional Epochs of History, with special reference to the Science of Politics and the Progress of Civilization.

III. *Senior Class.* Two exercises a week throughout the first term, elective. Lectures and recitations on (1) The rise and growth of European Colonies in North America and the causes of the War of Independence; (2) Comparative Politics from the standpoint of American institutions.

IV. *Graduate Course.* One exercise a week throughout the first and second terms. Historical methods and historical systems.

### **Jurisprudence and Political Economy.**

PROFESSOR JOHNSTON.

Under this head, a required course will be given to the Senior Class for two hours a week in first and second terms in the Philosophy of Public Law, in its connection with the material interests of the State; and in Political Economy, covering the historical development of the science, in all its phases and schools.

The elective course for two hours a week during the second and third terms, will cover International Law and the History of Diplomacy, from the Peace of Westphalia to the Treaty of Berlin, and the Constitutional Law of the United States, including also the provisions of the State systems, so far as they are necessary to explain the functions of the Federal system.

In 1885 a graduate course in the English Common Law will be available; and under it some consideration will be given to the questions of the individual's legal responsibility as affected by condition, and the legal responsibility of medical practitioners. An optional course of lectures on Roman Law, with Morey's Outlines of Roman Law as a text-book, will be given during the first term of Senior year; and Prof. Packard will follow it by reading the Institutes of Justinian with the class during the second term. An optional course in School Law will also be given by lecture during the Senior year for the benefit of those who intend to follow teaching as a profession.

## SCHOOL OF ART.

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Its endowment consists of \$60,000 from the residuary legatees of the late Frederick Marquand (through Henry G. Marquand). The department aims to establish a museum and to furnish instruction in the history of Art. To this end a Board of Directors has been appointed, consisting of President McCosh, William C. Prime, Henry G. Marquand, \*Geo. B. McClellan, James W. Alexander, Rev. S. B. Dod, and M. Taylor Pyne. Two Professors have been appointed—William C. Prime, LL.D., and Allan Marquand, Ph.D.

In addition to \$20,000 already subscribed, \$30,000 are still needed for the erection of a fire-proof building suitable to the purposes of a Museum of Historic Art. As the basis of the

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\*Deceased Oct. 31, 1885.

Museum the College now possesses the Sheldon Jackson collection of North American antiquities, the Van Lennep collection of Greek terra cotta heads, the Maimon collection of Assyrian gems, many examples of Mexican and Peruvian pottery, a large number of photographs and lantern slides, and a few casts. As soon as the building is erected it will receive the Trumbull-Prime collection of pottery and porcelain.

Since the publication of the last catalogue the Museum has increased its collection of books, photographs and slides and has received, from Mr. Henry Anstice—a crayon sketch of Sir Matthew Hale by E. L. 1677; from Mr. Harold Godwin—two Italian water color sketches; from Mr. Moses Taylor Pyne—one decorated Mexican Indian vase; from Mrs. John Story Gulick—two pieces of colonial handiwork and a promised legacy of miniatures and copies of old masters.

### History of Art.

#### PROFESSORS PRIME AND MARQUAND.

The instruction in this department for the present year will consist of—

- I. A few lectures by President McCosh on *Æsthetics*.
- II. A course of public lectures by Professor Wm. C. Prime, on the History of various Arts.
- III. Senior elective. Professor Marquand will lecture on the History of Ancient Art, with special reference to the Monuments of Greece and Rome. Two exercises a week during the second and third terms.
- IV. Optional. Professor Marquand will give a short course of lectures to Juniors and Seniors on the Arts of Egypt and Assyria.
- V. During the first term Professor Marquand will conduct a private class of Juniors in the study of Etruscan and Roman Antiquities, and during the second and third terms a class for graduates in the study of Greek Sculpture.

## DEPARTMENT OF LANGUAGE AND LITERATURE.

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### Greek.

PROFESSORS CAMERON, ORRIS, AND WINANS.

#### *Freshman Year.*

The Freshman Class is divided into four sections, each of which receives five hours of instruction in Greek every week during the first term, and four hours a week during the second and third.

POETRY.—Homer : The Iliad, Books XVI., XVIII., XXII. ; Epic Forms and Syntax ; Prosody and Scanning ; The Homeric Question ; Antiquities and Mythology.—Two exercises a week during the first and second terms, and one during the third, by Professor Cameron.

PROSE.—The Greek Historians : varied selections from Herodotus, Thucydides, and Xenophon, made with an aim to illustrate the best style of the author, and likewise, as far as practicable, to present thus from the original sources the history of the most interesting and important epochs,—the rise of the Persian Monarchy, the Persian Wars, Athens under Pericles, opening and closing scenes in the Peloponnesian War, the downfall of Athens. This is followed by a short course of Outlines of Greek History, in English, intended to review and supplement the previous course and to furnish a comprehensive view of the whole subject. The class is trained in reading at sight, and with the advanced sections a considerable amount of Herodotus is thus read.

Xenophon's Symposium is read in the third term, with sight reading of sections from the *Oeconomicus* ; accompanied also by talks on Greek domestic life.

Also, throughout the year, review of Greek Grammar, with elucidations ; Goodwin's doctrine of the syntax of the verb ; review of elementary Greek Prose Composition, with written exercises ; followed by advanced Greek Prose (Sidgwick's). Three exercises a week first term, two in second term and three in third term, by Professor Winans.

**NOTE.**—As the authors and the amount read during the Freshman year may vary from year to year, the following is indicated as a *minimum* for applicants for Sophomore standing: Homer, Books XVI., XVIII., XXII.; Greek Historians, 100 pages, selected at pleasure, one-half to be from Herodotus or Thucydides.

*Sophomore Year.*

The Sophomore Class is divided into sections, each of which receives four hours of instruction in Greek every week during the first and second terms, three hours during the third.

**GREEK ORATORY.**—The Olynthiacs and Philippics of Demosthenes; Demosthenes and the political condition of Greece in his time. The Rhetoric of Aristotle, Book III., with analyses and comments; Greek Prose Composition on the basis of the text of Demosthenes, including analyses in Greek of the Olynthiacs and Philippics; dictations on Greek lexicology, stating and explaining the laws pertaining to the formation, derivation and definition of the words of the language. The first half of the class recites in two subdivisions, each subdivision four hours a week during the first term; the second half in two subdivisions, each four hours a week during the second term, and the entire class two hours a week in third term to Professor Orris.

**POETRY.**—Euripides: the Medea. The origin of Tragedy; analysis of the Medea; life of Euripides. The second half of the class recites two hours a week during the first term, the first half two hours a week during the second term, and the entire class one hour a week in third term to Professor Cameron.

**PROSE.**—Xenophon: the Memorabilia. A selection is made of the more interesting parts of the memoirs, especially of such as are important to subsequent philosophical study. While these parts are read carefully, it is found practicable to read most of what is left at sight. Such general subjects are treated as,—the life of Xenophon; review of his works; his relations to Socrates as pupil and biographer; review of the political history of the period; the Socratic system of Ethics; the method and influence of Socrates as a teacher. Selections from Lucian;

society, religion, and literature of the second century, A. D. The second half of the class recites two hours a week during the first term, and the first half two hours a week during the second term to Professor Winans.

*Junior Year.*

**ELECTIVE GREEK.**—Attic Tragedy : Æschylus — selected dramas. Lectures on the Works of Æschylus, and on the origin, character and relations to Modern Literature of the Attic Drama. Two hours a week for half the year. Professor Orris.

Attic Comedy : Aristophanes—selected plays. Ordinarily one play is read critically, another more rapidly. The following are some of the collateral subjects treated by lecture, with references to various text-books : the Dionysus myth and worship ; the development and history of Comedy ; a review of Aristophanes' extant works and the fragments ; Aristophanes' literary criticisms, and his attitude toward the philosophical, social, and political movements of his time ; the presentation of comedies ; the metres of Comedy. Thucydides, Plutarch, Lucian, may be introduced either as a special course, or to furnish material for sight-reading. Two hours a week for half the year. Professor Winans.

**OPTIONAL.**—Lyric Poetry, or advanced Greek Prose Composition. Professor Orris.

*Senior Year.*

**ELECTIVE GREEK.**—In Senior year there are two independent elective courses, the first occupying two hours a week second and third terms, and the second two hours a week, first term.

**TRAGEDY.** — Sophocles. The *Œdipus Tyrannus*. Criticism of the play, the plot, the significance of the tragedy. Description of the Greek theatre. Lectures on the Physical Geography of Greece as affecting the character and language of the people ; the origin of the Greek alphabet ; the characteristics of the Greek language ; rise and character of Greek literature ; Epic poetry ; Lyric poetry ; History ; Tragedy ; Comedy ;

Oratory ; Philosophy ; Greek Antiquities ; Manners and Customs ; Remains of Cities and Buildings. Professor Cameron.

GREEK PHILOSOPHY. — Plato : selected dialogues. Lectures on the Philosophy of Plato ; on Greek Literature and Philology ; on the theories of the Origin of Language, and on the causes which underlie and determine dialectic varieties. Professor Orris.

OPTIONAL.—Theocritus, with a review of his relations to subsequent Poetry. Professor Orris.

#### SCHOOL AT ATHENS.

This College, in connection with others, assisted in establishing, and contributes to the support of the American School of Classical Studies at Athens. This school affords facilities for archaeological and classical investigation and study in Greece, and graduates of this College are entitled to all its advantages free of tuition. Professor Sloane represents Princeton in its Managing Committee.

#### Latin.

PROFESSORS PACKARD AND WEST AND TUTOR WESTCOTT.

Instruction given in the Department of Latin Language and Literature and Science of Language, involves,

*First*—The constant training of classes in the Etymology and Syntax of the language, and in the power to translate it accurately and fluently into idiomatic English.

*Second*—Instruction in Latin Prose Composition. The object here aimed at is not facility in writing Latin as a mere accomplishment, but rather the acquisition of power to translate at sight any ordinary Latin into fluent literary English, and also to think easily in the Latin order of thought.

In the Freshman year written exercises form the basis of instruction. These exercises are examined in order to leave no errors uncorrected. Practice in extemporaneous composition, both oral and written, is continually attempted, on as extensive a scale as the student's grammatical knowledge permits.

Thematic composition, in its higher forms, is reserved for later optional study.

*Third*—The reading and interpretation of particular authors, whether literary or historical, or both combined. This implies, as collateral branches of study, the History of Roman Literature and the Archæology of Roman Life, social and political. Roman History is studied in its three leading periods; first, in connection with portions of Livy's Histories, the early history down to the times of the Gracchi; second, in connection with Cicero's Letters, the period from the Gracchi to the Empire; and, third, in connection with Juvenal's Satires and Pliny's Letters, the earlier Empire, especially its moral and religious aspects in contrast with Christian Truth and Christian Life.

The exercises with the two lower classes are chiefly recitations, accompanied, or rather interspersed with constant communication of collateral illustrative instruction suggested by the text-book, calculated to quicken and broaden the interest of the student; with care, however, not to infringe upon the frequency and thoroughness of the recitations required of the student. Occasional lectures of a more formal character are introduced in the Sophomore year. These treat, in connection with Cicero's Letters, the representative characters and historical scenes and topics there found; and in connection with Horace, the History of Literature down to his time, his contemporaries, the introduction and influence of Greek, especially Alexandrian, literature at Rome, and his own characteristics as to topics, style, views of life, etc.

In reading Terence and Plautus, translation is desired as close to literary English as the comic style and sentiment will allow; and to this end the class is required to read large portions in review and at first sight in advance work. Practice is given in reading the comic metres in order to show their high dramatic and linguistic value, especially as bearing upon the colloquial pronunciation of Latin. Among other topics investigated are the principles of language-change embodied in the metres, the literary obligations of Terence to Plautus, and of both to early Latin literature and the Greek comedians, the social life of Rome in the second century B. C., and the relations of ancient to modern comedy.



In the Junior year lectures are more frequent ; in connection with Juvenal and Pliny, treating of the other sources of our more intimate knowledge of the social and moral condition of the Empire in Italy and the Provinces ; and, in connection with such of Cicero's rhetorical, ethical, or religious treatises as are read, treating of literary life and training at Rome, the sources and character of Roman Philosophy, and the Religion of Rome. In the Senior year lectures occupy about one-third of the time, being in part illustrative of Lucretius, but chiefly upon the Science of Language, its General Principles, Physiology of Speech, Phonetic Laws, Formation of Words, History of Inflections, Comparative Laws of Syntax.

The authors used in the order of the curriculum are Livy ; Horace's Odes ; Selected Letters of Cicero ; Terence ; Catullus ; Horace's Satires and Epistles ; Tacitus ; Juvenal's Satires ; Selected Letters of Pliny ; Suetonius ; Plautus ; Cicero's Treatises (De Oratore, De Natura Deorum, De Fato, etc., varying from year to year) ; Lucretius, De Rerum Natura ; Bruns, *Fontes Juris Romanæ*, with use of *Corpus Inscriptionum Latinarum*, and Ritschl, *Priscæ Latinitatis Monumenta*, *Justiniani Institutiones* ; Selections from Seneca's Moral Epistles ; also from Tertullian and St. Augustine.

The instructors suggest questions for special investigation, and designate volumes and parts of volumes, illustrative of the author or period under study, to be read in private by the class during the term, upon which questions are put in examination papers, eliciting extended written answers.

On two evenings of each week such students as wish, meet with Professor Packard for the study of some Latin work collateral with the class-room exercises. The Sources of Roman Law constitutes the Graduate course for the present year.

### **English Literature.**

**PROFESSOR MURRAY.**

The study of English Literature is pursued during the Junior year, and through the first term of the Senior. It includes both a required and an elective course.

*Junior Year.*

The required course extends through the year, occupying two hours a week. In the first term special attention is given to the study of Chaucer, in order to gain some knowledge of the English language at that stage of its development; mainly, however, for the sake of his poetry. In addition to lectures, some of Chaucer's poems are read in the class room. After Chaucer, Spenser and the English Drama before Shakespeare are the subjects of study.

In the second and third terms lectures are given on Elizabethan Dramatists and on Bacon, Milton, and Dryden. The great writers of the Queen Anne Period are also discussed. The required course ends with study of the Literary Restoration under Cowper, Burns and Wordsworth, and of some representative authors of the Victorian Period, especially Tennyson and Thackeray.

During the third term a play of Shakespeare is studied in the class room, with reference to a further study of Shakespeare in the Senior year.

*Senior Year.*

The elective course, to which two hours a week through the first term are assigned, is mainly devoted to critical study of Shakespeare's plays. The choice of these varies from year to year. Those to be read this year are King Lear, Hamlet and one of the Comedies.

An optional class is formed during the second term, for reading authors not treated in the class room. Essays also are required from both the Junior and Senior classes, in which literary subjects chiefly are discussed.

A graduate course will be offered next year, comprising lectures on the following subjects:

1. Comparative Literature.
2. Dramatic Literature.
  - (a) Shakespeare's Historical Plays.
  - (b) The Comedies of Ben Jonson.
  - (c) The plays of John Ford.

**English Language and Discourse.****PROFESSOR HUNT.***Freshman Year.*

The elements of Discourse are studied as embraced in the following subjects: Theme, Choice of Material, Diction and Structure, Style. The study of English Words, as given in Trench, (Study of Words, Select Glossary,) is also pursued. Essay writing is an essential part of the course, and is continued through the year. Lectures on English Vocabulary.

*Sophomore Year.*

The study of Discourse—its principles, processes, qualities and forms—is pursued. Also, the historical study of the English language. Essays are required throughout the year.

*Junior Year.*

The study of Anglo Saxon as an elective branch is begun. On the basis of March's text-books the student is drilled in the forms and principles of grammar and taught to read with ease the best prose and poetry of First English. In connection with this grammatical and textual study, instruction is given by lecture on a large variety of subjects—philological and historical—rightfully included in such a course. The students are also encouraged to private reading on any of the topics presented in the class-room. Beowulf and Caedmon are read as an advanced course.

**Oratory.****PROFESSOR RAYMOND.***Freshman Year.*

First Term. Weekly lectures and drill in elocution, explaining the meanings and teaching the methods of Gesture and Vocal Emphasis, with readings and declamations required from all the class. Text-book, Raymond's Orator's Manual.

*Sophomore Year.*

Exercises according to degrees of proficiency. Two private rehearsals of declamation and one written oration required from all. Optional instruction in Vocal Culture.

*Junior Year.*

Oratorical Composition and the Analysis and Illustration of Themes, taught by lecture and private criticism. One written oration and two rehearsals in delivery required from all. Optional Rehearsals; Exercises in Vocal Culture; Lectures (begun the second term) on the Principles of Elocution as exemplified in Poetry and the other arts.

*Senior Year.*

Course of the Junior year continued. Two written Orations; Private Criticisms and Rehearsals, and Public Speaking before the whole college, with prizes in Oratory, Delivery, Poetry and Disputation (See "Prizes and Competitive Scholarships"). Between fifteen and twenty of the best writers and speakers among the highest honormen deliver orations at commencement. Optional Rehearsals; Exercises in Vocal Culture; Lectures on the Principles of Æsthetic Criticism, with illustrations from the different arts.

**Exercises in English Composition.**

These are corrected by the Professors of English Literature, Rhetoric and Oratory, and are required as follows, viz. : Freshman year, five or six Essays; Sophomore year, five or six Essays and one Oration; Junior year, five Essays and one Oration; Senior year, two Essays and two Orations. In every year of the course several prizes or honorary appointments are given for excellence in essay writing and in public address, either by the College, or by the Cliosophic or American Whig Societies, acting through committees appointed from their own members in the Faculty. (See heading "Fellowships, Prizes, Scholarships.")

**Modern Languages.**

PROFESSOR KARGÉ.

This course comprises the study of the French and German languages. The former begins as a required study in second term Freshman year and continues through the Sophomore year, twice weekly. Recitations are conducted in divisions averaging twenty-five students each. For a better apprehension of the thought as well as for greater facility in the use of the language, oral and written recitations alternate. Essential rules pertaining to grammar-forms, pronunciation, paradigms of regular and of irregular verbs, translation from English into French, reading and analysis, constitute the course of instruction in the Freshman year.

*Sophomore Year.*

Review of the course of the preceding year, with a more comprehensive treatment of the verb as regards the use of tenses, moods and participles ; this in addition to a study of the essential principles which characterise the origin and development of the language, constitutes the first term's instruction. Half of the second term is spent in reading George Sands' *La Mare au Diable*, in which idiomatic expressions and delicate shades of modern French construction are carefully noted. For a better comprehension and appreciation of the study of French Literature, the remainder of the year is taken up with reading Lacombe's *Petite Histoire du Peuple Français*. As introductory to the classical writers, selections from Corneille's *Cid*, Racine's *Athalie* and Moliere's *Le Bourgeois Gentilhomme* are critically read and interpreted. At the close of the Sophomore year, students are required to pass a final oral and written examination in descriptive grammar and in the history of the language ; moreover, to render at sight into fluent English any given author, whether in prose or poetry.

*Junior Year.*

Such students as have acquired during the preceding two years sufficient knowledge can, if so inclined, pursue an inde-

pendent course of study in French, while an opportunity is offered them to take up German twice weekly as an elective for the remainder of their college course. As the difficulties in pronouncing German are in no way to be compared with those met with by the student in French, reading, grammar-forms and translation into English are simultaneously taken up, and when a fair knowledge of the verb and its construction is attained, easy and interesting German prose is read, whereby the students are encouraged to form and answer questions in the vernacular. Towards the middle of the second term, Goethe's *Hermann und Dorothea* is taken up, the German itself being used, as far as time permits, in conducting the recitations.

#### *Senior Year.*

Besides the reading of Lessing's *Nathan der Weise*, Minna von Barnhelm and Schiller's *Jungfrau von Orleans*, a portion of each hour is devoted to lecture, in which the literary history of leading European nations, from the Italian Renaissance to the unification of Germany, is expounded.

Provision will shortly be made for instruction in the Italian and Spanish languages.

#### **Sanskrit.**

PROFESSOR WINANS.

Sanskrit is a two hour elective in Senior year. Students are requested to advise with the professor before electing it. In the grammatical study special attention is paid to the bearing of the language on Philology and Comparative Grammar. The various phenomena of the language, its sounds, roots, forms, inflections, are considered with some detail in relation to those of other Aryan tongues. The following is an outline of the early stages of the course: *Sanskrit Primer* (Perry), a series of graded lessons on the plan of Greek and Latin first-lessons; reading of several books of the *Nalopâkhânam*, an episode in the great Hindoo epic, the *Mahâbhârata*, with review of *Sanskrit Grammar* (Whitney's); then, selections from the *Hitopadeṣa*. This year the course will begin with the second term.

**DEPARTMENT OF MATHEMATICS AND  
NATURAL SCIENCE.****Mathematics.**

PROFESSORS DUFFIELD AND FINE AND TUTOR CARMAN.

In the Freshman year there are two exercises a week during the first and second terms in Algebra and two exercises a week during the third term in Plane Trigonometry under Professor Fine; in Geometry there are two exercises a week throughout the year under Tutor Carman. The text-book in Algebra for the present year is Wells' University Algebra, to be supplemented by a course on the Theory of Equations by the professor. Euclid is used as the text-book in Geometry because of its historical associations and its decided superiority for the purpose of mental discipline to any modern text-book. The first six and the eleventh books of Euclid are supplemented by a course in Solid and Spherical Geometry. Since a thorough knowledge of Geometry and familiarity with its more important propositions can be obtained only by extended practice in the demonstration of theorems and problems not contained in the text-book, this exercise occupies a prominent place in our course of instruction.

The Sophomore Class has three exercises a week throughout the year in Mathematics, under Professor Duffield. For the first term the studies are Analytical Trigonometry, Mensuration and Navigation; for the second and third terms, Surveying, Spherical Trigonometry, Analytical Geometry and the elements of the Differential Calculus.

In the Junior year, Mathematics is an elective study. The class has two exercises a week throughout the year under Professor Duffield. For the first and second terms the studies are Analytical Geometry and the Differential Calculus; for the third term, the Integral Calculus. During the Sophomore and Junior years, Loomis' text-books are used—supplemented largely by oral instruction, and numerous exercises in addition to the Examples for Practice of the text-books.

The Senior class in Mathematics (elective) has two exercises a week throughout the year under Professor Fine. The course for the current year is Analytical Geometry of Three Dimensions, Differential and Integral Calculus (Williamson) and a short course in Determinants.

A characteristic feature of our method of teaching Mathematics is the prominence given to oral instruction. Throughout the course, lectures on the history as well as on the principles of the different branches of study are given by the instructors.

### **Astronomy.**

**PROFESSORS YOUNG AND MCNEILL.**

#### *General Course—Required.*

The course occupies three hours weekly, during the first half of the year. There are two examinations, one just before the Thanksgiving recess, and one at the close of the course.

In the first half of the course, the principal subjects treated are astronomical instruments, the methods of finding time, latitude and longitude, the earth in its astronomical relations, and the moon. In the second part, the sun, the planetary system and the stars are discussed.

The aim of the course is to impart a knowledge of the most important facts of the science, with an understanding of its principles, but the higher mathematics of the subject are not attempted. The class have frequent opportunities for examining the most interesting objects with the telescope.

#### *Practical Astronomy—Elective.*

One exercise weekly during Senior year. Text-book, Loomis' Practical Astronomy. The exercises consist of lectures upon the various instruments and their uses, with recitations from the text-book, and the discussion of the observations made by the class.

When the weather permits, each member of the class is required to spend from two to six hours weekly in making and reducing observations. The principal subjects embraced in the course are the following :



**I. SEXTANT AND REFLECTING CIRCLE.**

- (a) Adjustment and errors.
- (b) Determination of local time by altitudes of the sun (or stars).
- (c) Latitude by circum-meridian altitudes of the sun.
- (d) Latitude by altitude of the pole star and a corresponding southern star.
- (e) *Determination of the eccentricity and graduation errors of the instrument.*

**II. TRANSIT INSTRUMENT.**

- (a) Theory of errors and adjustment.
- (b) Determination of local time by star observations, the azimuth correction being determined by a pair of circumpolars.
- (c) *Reduction of a complete set of time observations by the method of least squares.*

**III. THE ZENITH TELESCOPE.**

- (a) Determination of latitude from star observations, the instrumental constants being independently determined.
- (b) *Determination of latitude, together with the instrumental constants, by observations reduced by the method of least squares.*

**IV. PRIME VERTICAL INSTRUMENT.**

Determination of latitude and instrumental constants by star observations.

**V. ASTRONOMICAL THEODOLITE.**

- (a) Azimuth by observations of the pole star.
- (b) *Latitude and time by Gauss' "three-star method."*

**VI. MERIDIAN CIRCLE.**

- (a) Determination of instrumental constants.
- (b) Determination of star places (right ascension and declination), including the reduction of apparent place to mean.
- (c) *Investigation of errors of graduation and periodic errors of micrometer screw.*

**VII. EQUATORIAL.**

- (a) Adjustment of the instrument.
- (b) Determination of the place of a comet or minor planet by the ring or square micrometer.

- (c) Study of the spectra of sun spots and solar prominences.
- (d) *Measurement of double stars with the wire micrometer.*

#### VIII. MISCELLANEOUS.

- (a) Value of level divisions determined with the "level-trier."
- (b) Determination of personal equation with Eastman's personal equation machine.
- (c) *Form and size of transit instrument pivots determined with pivot spherometer.*

NOTE.—The italics denote problems regarded as supplementary. For want of time they are not generally all taken by any one member of the class, but are distributed according to circumstances.

### Physics.

PROFESSORS BRACKETT AND MAGIE.

#### *Junior Year.*

REQUIRED COURSE.—This course is conducted by means of recitations and lectures. Anthony and Brackett's Elementary Physics is used as a text-book. The subjects treated are :

First term—Elementary Mechanics ; General Properties of Bodies ; Hydrodynamics ; Pneumatics ; Heat and Thermodynamics.

Second term—Magnetism ; Electrostatics ; Electrodynamics.

Third term—Acoustics ; Optics.

The valuable and well selected apparatus with which the department is supplied, is constantly employed to illustrate and enforce the principles discussed.

Four hours a week during the first term, and three hours a week during the second and third terms are allotted to this course.

#### *Senior Year.*

ELECTIVE COURSES.—These courses, in general, involve practical work in the Physical Laboratory. They afford opportunity for the extended study of special topics.

The students pursuing the laboratory courses are referred to Kohlrausch's Physical Measurements, *Einleitung in die Prak-*

tische Physik—Pscheidl, etc., and to the special manuals and memoirs accessible in the Library of the College. In addition, recitations upon Cumming's Theory of Electricity are required from those studying Electricity.

The following are among the problems ordinarily assigned : Determinations of the intensity of the force of gravity at Princeton, by the method of Kater and by that of Borda ; determination of the modulus of elasticity for different metals ; determination of the magnetic declination and of the horizontal component of the Earth's magnetism, by the magnetometer ; determination of the magnetic dip and of the total magnetic force by means of the dip circle ; measurement of the electro-motive force of various elements in absolute units by means of the absolute electrometer and by means of the quadrant electrometer ; measurement of electric currents by means of the voltameter ; verification of Faraday's laws of electrolysis ; determination of the efficiency of the dynamo-machine ; measurement of the work expended in maintaining an incandescent lamp in action, (1) by means of the electric relations of the circuit, (2) by means of the calorimeter ; determination of index of refraction by several methods ; verification of Fresnel's researches in diffraction, with discussion ; measurements of wave lengths of light by simple diffraction methods and by means of the spectrometer ; examination of the phenomena and laws connected with polarized light ; determination of specific heats by various calorimetric methods ; investigation of radiant heat by means of Melloni's apparatus ; Hygrometry.

Those electing these courses are expected to devote at least two hours a week to laboratory work. At the close of the year, each student is required to present a thesis discussing some problem previously assigned.

A course in Mathematical Physics is also offered, intended to prepare those electing it for advanced work in Physics. To this end special attention is paid to Analytical Mechanics. Minchin's Uniplanar Kinematics is used this year as an introductory text-book. The books to be used in the remainder of the course have not yet been decided upon.

### **Chemistry.**

**PROFESSOR SCHANCK.**

Students in the Academic Department attend a required course in General Chemistry throughout the entire Senior year, and an elective course in Applied Chemistry during the second and third terms.

The course of instruction in General Chemistry occupies two hours in the class-room each week, and in this course the attempt is made to give quite fully the leading principles and facts of General Chemistry, enforced by carefully prepared experimental illustrations. Besides these table illustrations, free use is made of lantern projections. The advantage of taking notes and of reading, in connection with the lectures, such works as Roscoe's, Fownes', Wurtz's, Miller's and Roscoe and Schorlemmer's, is appreciated and urged upon the class.

The additional parallel and elective course, embracing the leading applications of Chemistry in the arts of life, also illustrated fully, occupies one hour each week second and third terms.

### **Laboratory Chemistry.**

**PROFESSOR CORNWALL; DR. MCCAY, ASSISTANT.**

This branch of Chemistry constitutes an elective study during the first term of the Senior year. The course includes lectures, with occasional recitations, and also work in the Laboratory. Qualitative chemical analysis is first taken up, the students learning to detect single bases and acids, acquiring thereby sufficient training to pursue further the study of qualitative analysis without supervision, should they desire to do so. At the same time they are required to explain fully, by chemical formulas and written explanations, all of the reactions involved in making the tests.

During the latter part of the term, experiments illustrating principles of General Chemistry and Chemical Physics are first performed by the students, after which the most important classes of organic compounds are studied, and finally a few

special examinations are made, such as : analysis of potable waters ; examinations of milk ; study of the general properties of the alkaloids, with a few characteristic tests ; properties of disinfectants, etc. The object of the course is to train the student, as far as possible, in chemical manipulation, by means of experiments which shall both illustrate chemical principles and furnish practical knowledge likely to be of use in any subsequent professional or scientific study.

The course requires five or six hours a week ; three or four hours being generally devoted to laboratory work, and two hours to lectures and recitations.

### **Geology and Palæontology.**

PROFESSORS SCOTT AND OSBORN.

I. GEOLOGY.—The course in Geology, conducted by Professor Scott, occupies three hours a week through the last half of the Senior year. The subjects treated are (1) Dynamical Geology ; (2) Structural Geology, including Lithology and Petrography ; and (3) Historical Geology and Palæontology. The text-book used is Le Conte's Elements of Geology (revised edition).

II. PALÆONTOLOGY.—The course in Palæontology is one of the elective studies of the Senior Class and occupies about three hours a week throughout the year, including one lecture and two hours of laboratory work a week. This course, under Professor Scott, is devoted chiefly to the subject of Vertebrate Palæontology and Anatomy, and is a continuation and expansion of the course of the Junior year on Historical Geology. Two hours a week are given to the laboratory work under the direction of Professors Osborn and Scott. This is a parallel course of anatomical study, with dissection of the fishes, reptiles, birds and mammals, which represent living groups and throw most light upon the structure and development of the fossil vertebrates as described in Professor Scott's lectures. The dissections are accompanied by demonstrations and drawings. Practical work is also carried on in the zoölogical and geological museums, and a new feature of the course this year is a series of museum de-

monstrations with explanations and comments upon the specimens in various collections. At the close of the course, a short original thesis on one of the fossil vertebrates in the E. M. Museum is required of each student and takes the place of the lectures and practical work of the third term. The text-books employed are Huxley's *Anatomy and Vertebrates*, Parker's *Zoöatomy* and Wiedersheim's *Lehrbuch der vergleichenden Anatomie*.

For advanced students there are especial facilities for study in the large number of undescribed fossil Vertebrates collected in the West by the scientific expeditions sent out by the College in 1877, 1878, 1882 and 1885.

### **Physical Geography.**

PROFESSOR LIBBEY.

This course occupies two hours each week throughout the second and third terms of Junior year, as an elective study. It consists of the study of the Earth in the Age of Man, comprising two parts :

A. THE GEOGRAPHY OF NATURE, or Physical Geography proper.

1. The Earth in the Solar system ; Astronomical Geography, especially with reference to Climatology.

2. The Earth as a whole, or Physics of the Globe ; its form, dimensions, density, and weight ; its proper temperature, volcanoes and earthquakes ; its magnetism.

3. The surface of the earth.

a. The Lands, their arrangements ; morphology of the continents ; laws of relief.

b. The Waters and their movements ; Inland waters and continental drainage ; Oceanography ; Tides and marine currents :—the facts and their causes.

c. The Atmosphere ; Climatology ; Laws of distribution of temperature ; Winds and Rains ; Snow, ice and glaciers.

4. Laws of the distribution of life. Plants and Animals.

B. GEOGRAPHY OF MAN, or the relations of Physical Geography to the History of mankind ; Human races, characteristics

and law of distribution, contrasted with the distribution of life in nature; the historic races and their functions in history. The continents as instruments for the development of human societies. The continents of Nature: Africa, South America, Australia. The continents of History: Asia, Europe, North America. Their special functions in the progressive development of mankind.

Lectures and recitations, with oral and written examinations. Text-books,—Physical Geography, Guyot; Earth and Man, Guyot. Both courses are abundantly illustrated by maps and diagrams; and an optional course of lectures is given in which the lantern is used to illustrate the phenomena treated of in the regular course by means of a series of views from nature, numbering upwards of four thousand.

### **Biology.**

PROFESSORS SCHANCK, MACLOSKIE, OSBORN, SCOTT;  
MR. PETERS AND MR. RANKIN.

The required studies in this branch are included in a course which occupies one hour a week of the first and second terms, and two hours a week of the third term of the Sophomore year. Professor Schanck opens the course with a series of lectures, illustrated by models and diagrams, upon Human Anatomy and Physiology. Professor Macloskie resumes the work during the second term in a series of lectures on Elementary Zoölogy. In the third term Professor Macloskie conducts a series of recitations in Botany, accompanied by practical work in the examination of plants. In the Senior year, students may elect either Biology, or Palæontology. The latter is conducted by Professor Scott, with practical biological work under Professor Osborn. (See Course in Geology.)

The elective course in Biology is conducted by Professor Macloskie with the coöperation of Professor Osborn. This course occupies one required and three optional hours a week, and the subjects are divided as follows: (1) Structural Botany and the Invertebrate Animals, under Professor Macloskie, including the structure and physiology of the principal plant-

types and types of Invertebrates; among the latter are such forms as the Amœba, the Lobster, the Locust, the fresh-water Mussel, and the Ascidians. The laboratory work connected with this study includes dissection and the use of the microscope upon the typical plant and animal forms. (2) The second part of the course, under Professor Osborn, opens in February, and consists of ten lectures upon the general anatomy of the Vertebrates, upon the influences of natural environment, and upon the history of the theory of development of living types.

The practical work is upon Embryology and covers a microscopic study of the early development of the chick, following the course laid out in Foster and Balfour's *Elements of Embryology*, and obtaining embryos by the aid of an incubator.

During the second term an optional course of lectures on the Embryology of the Vertebrates will be given by Prof. Scott.

### Histology.

PROFESSOR LIBBEY.

This study is an elective, occupying one afternoon each week during the first term of Senior year, and consists of lectures and recitations upon Normal Histology. Only the normal tissues are discussed, and as wide a range of comparative study of the tissues in the animal kingdom is made as the time allotted permits. Especial attention is devoted to injecting, hardening, preserving, staining and mounting specimens, and students are carefully drilled in section-cutting and in the use of the microscope, every facility being placed in their hands to enable them to do good work.

The lecture occurs on Wednesday afternoon of each week at 8 o'clock, but the laboratory is open at all hours to its regular students for private investigation, and the instructor or the Biological Fellow will be present every afternoon to give assistance to those who may be present. A fee of \$10 is charged to cover mounting material, slides, etc.

Text-books recommended,—Klein, Prudden, Shakespeare-Allen, Stirling, Striker.



**SYNOPSIS OF COURSE.****FRESHMAN YEAR.***First Term.*

**LATIN**—Livy, (Book I). Roman History (Leighton's History of Rome). Latin Prose Composition. **GREEK**—Homer's Iliad, (Books XVI, XVIII, XXII). Selections from Herodotus, Thucydides, Xenophon. Greek Grammar. Greek Prose Composition. **MATHEMATICS**—Algebra (Wells'). Geometry (Todhunter's Euclid). **ENGLISH**—Elementary Discourse (Diction and Sentences). English Language. Trench's Study of Words. Trench's Select Glossary. Lectures on Rhetoric and English Language. Essays. **ORATORY**—Lectures, and Drill in Elocution.

*Second and Third Terms.*

**LATIN**—Livy, (Books XXI, XXII). Roman History (Leighton's History of Rome). Cicero : De Senectute, De Amicitia. Horace : Odes (three Books). Latin Prose Composition. **GREEK**—Homer's Iliad, Herodotus, Thucydides, Xenophon, selections. Outlines of Greek History. Greek Prose Composition (Sidgwick's). **MATHEMATICS**—Algebra (Wells'). Geometry (Todhunter's Euclid). Solid and Spherical Geometry. Plane Trigonometry. **ENGLISH**—Essays. **FRENCH**—Grammar (Substantive, Adjective, Numeral, Pronoun), with oral and written exercises.

**SOPHOMORE YEAR.***First Term.*

**LATIN**—Selected Letters of Cicero. Roman History from the Gracchi to Augustus. Terence : Phormio, Adelphi. Catullus. **GREEK**—Demosthenes : the Olynthiacs and Philippics. Rhetoric of Aristotle, selections. Word-Formation. Laws of Phonetic change. Greek Composition. Euripides : The Medea. Xenophon's Memorabilia. **MATHEMATICS**—Analytical Trigonometry, Mensuration and Navigation. **ENGLISH**—Essays. **FRENCH**—Grammar completed. **HUMAN ANATOMY AND PHYSIOLOGY**. **HISTORY**—Freeman's General Sketch. **ORATORY**—Elocution. Declamations. Written orations.

*Second and Third Terms.*

**LATIN**—Horace : Selected Satires and Epistles. Terence : Hecyra, Andria. Catullus. Tacitus : Agricola and Histories. **GREEK**—Demosthenes : the Olynthiacs and Philippics. Rhetoric of Aristotle : Selections. Word-Formation. Laws of Phonetic Change. Greek Composition. Euripides : The Medea. Xenophon's Memorabilia. Dialogues of Lucian (Williams' Selections). **MATHEMATICS**—Surveying. Spherical Trigonometry. Analytical Geometry. Elements of the Differential Calculus. **ENGLISH**—Advanced Discourse. "Principles of Discourse" (Hunt) or equivalent. English Language, Lounsbury (Part I) or equivalent. Lectures on English Language and Style. Essays. **FRENCH**—Syntax. Selections from George Sand, Lacombe, Corneille, Racine, Molière. **ZOOLOGY and BOTANY**. **ORATORY**—Elocution. Declamations. Written Orations.

**JUNIOR YEAR.***First Term.***REQUIRED STUDIES.**

**PSYCHOLOGY**—McCosh's "The Senses" and "Intuitions of the Mind." **ENGLISH LITERATURE**—Chaucer. Lectures. Essays. **PHYSICS**. **ORATORY**—Analysis and Composition of Themes. Theory and Practice.

**ELECTIVE STUDIES.**

*In Philosophy*—**PHILOSOPHY OF HISTORY**.

*In Literature*—**LATIN**—Cicero De Natura Deorum and De Fato. **GREEK**—Aristophanes : Clouds, Frogs. Lectures. **GERMAN**—Grammar. Oral and written translations from English into German. Whitney's German Reader. **ANGLO-SAXON**—March's Anglo-Saxon Grammar and Reader. Caedmon's Exodus and Daniel (Hunt). Beowulf (Harrison). Lectures on First English.

*In Science*—**MATHEMATICS**—Analytical Geometry.

*Second and Third Terms.***REQUIRED STUDIES.**

**PSYCHOLOGY**—(Concluded). **LOGIC**—McCosh's Manual. **ENGLISH LITERATURE**—Lectures. Essays. **PHYSICS**. **ORATORY**—Criticism. Written Orations. Delivery.

## ELECTIVE STUDIES.

*In Philosophy*—PHILOSOPHY OF HISTORY.

*In Literature*—LATIN—Juvenal, with History of the Empire. Selected Letters of Pliny. Suetonius. Plautus : Miles Gloriosus. GREEK—Æschylus : Selected Dramas. Lectures on the Attic Drama. FRENCH—Syntax. Racine's *Athalie*. Corneille's *Cid*. GERMAN—Grammar and Prose Composition. Goethe : *Hermann und Dorothea*.

*In Science*—MATHEMATICS—Differential and Integral Calculus. PHYSICAL GEOGRAPHY.

## SENIOR YEAR.

*First Term.*

## REQUIRED STUDIES.

ETHICS—Calderwood's *Moral Science*. Lectures. JURISPRUDENCE AND POLITICAL ECONOMY—Lectures. ENGLISH—Essays. ASTRONOMY—Newcomb and Holden's. Lectures. CHEMISTRY—Fownes'. Roscoe's. Wurtz's. Miller's. ORATORY—Criticism. Written Orations. Public Address.

## ELECTIVE STUDIES.

*In Philosophy*—METAPHYSICS. PHYSIOLOGICAL PSYCHOLOGY. COMPARATIVE POLITICS.

*In Literature*—ENGLISH LITERATURE—Shakespeare. GREEK—Sophocles : *Œdipus Tyrannus*. Aristotle's *Ars Poetica*. Plato : Selected Dialogues. Greek Literature and Philology. GERMAN—Lessing : *Nathan der Weise*, *Minna von Barnhelm*. Schiller : *Jungfrau von Orleans*. Lectures. SANSKRIT—Perry's *Primer*.

*In Science*—MATHEMATICS. ASTRONOMY—Practical. PHYSICS—Practical course in the Laboratory. LABORATORY CHEMISTRY. BIOLOGY or PALÆONTOLOGY. HISTOLOGY.

*Second and Third Terms.*

## REQUIRED STUDIES.

ETHICS (concluded). SCIENCE AND RELIGION—Lectures and Recitations. JURISPRUDENCE AND POLITICAL ECONOMY—Lectures. ENGLISH—Essays. ASTRONOMY—Newcomb and Holden's. Lectures. CHEMISTRY. GEOLOGY—Le Conte's. Lectures.

## ELECTIVE STUDIES.

*In Philosophy*—HISTORY OF PHILOSOPHY. SCIENCE AND RELIGION—Lectures. INTERNATIONAL AND CONSTITUTIONAL LAW—Gallaudet's Manual. Lectures. HISTORY OF ART—Ancient.

*In Literature*—LATIN AND THE SCIENCE OF LANGUAGE—Lucretius. Lectures on general principles of Philology and on Comparative Inflection and Syntax. GREEK—Sophocles: *Œdipus Tyrannus*. Greek Literature. GERMAN—Review of Grammar. Lessing: *Minna von Barnhelm*. Goethe: *Hermann und Dorothea*; *Faust*, first part. Schiller: *Jungfrau von Orleans*. Lectures on the History and Literature of the Language. SANSKRIT—Perry's Primer.

*In Science*—MATHEMATICS. ASTRONOMY—Practical. PHYSICS—Practical course in the Laboratory. APPLIED CHEMISTRY. BIOLOGY or PALÆONTOLOGY.

### EXHIBIT OF STUDIES FOR THE FOUR ACADEMIC YEARS.

NOTE.—The numbers indicate hours per week.

## FRESHMAN YEAR STUDIES.

## ALL REQUIRED.

<i>First Term.</i>		<i>Second Term.</i>		<i>Third Term.</i>	
Latin,	4	Latin,	3	Latin,	5
Greek,	5	Greek,	4	Greek,	4
Math.,	4	Math.,	4	Math.,	4
English,	2	French,	2	French,	3
—		—		—	
Total hours,	15		15		15

## SOPHOMORE YEAR STUDIES.

## ALL REQUIRED.

<i>First Term.</i>		<i>Second Term.</i>		<i>Third Term.</i>	
Latin,	3	Latin,	3	Latin,	3
Greek,	4	Greek,	4	Greek,	3
Math.,	3	Math.,	3	Math.,	3
History,	2	English,	2	English,	2
French,	2	French,	2	French,	2
Anatomy,	1	Zoölogy,	1	Botany,	2
	—		—		—
Total hours,	15		15		15

## JUNIOR YEAR STUDIES.

## I. REQUIRED.

<i>First Term.</i>		<i>Second Term.</i>		<i>Third Term.</i>	
Physics,	4	Physics,	3	Physics,	3
English,	2	English,	2	English,	2
Psychology,	2	Psych. & Logic,	3	Logic,	3
	—		—		—
Hours req'd,	8		8		8

## II. ELECTIVE.

(The student selects three subjects.)

Latin,	2	Latin,	2	Latin,	2
Greek,	2	Greek,	2	Greek,	2
Math.,	2	Math.,	2	Math.,	2
French,	2	German,	2	German,	2
History,	2	History,	2	History,	2
Anglo-Saxon,	2				
	—	Phys. Geog.,	2	Phys. Geog.,	2
	—		—		—
Hours elect.,	6		6		6
	—		—		—
Total hours,	14		14		14

## SENIOR YEAR STUDIES.

## I. REQUIRED.

<i>First Term.</i>		<i>Second Term.</i>		<i>Third Term.</i>	
Astronomy,	3	Ast. & Geology,	3	Geology,	3
Chemistry,	2	Chemistry,	2	Chemistry.	2
Ethics,	2	Ethics,	1		
		So. & Rel.	1	Sc. and Rel..	1
Jur. and Pol. Ec.	2	Jur. and Pol. Ec.	2		
Hours req'd,	<u>9</u>		<u>9</u>		<u>6</u>

## II. ELECTIVE.

(The student selects 6 or 7 hours).

## I. Philosophy.

Metaphysics,	2	Hist. Philos.	2	Hist. Philos.	2
Comp. Pol.,	2	Sc. and Rel.	2	Sc. and Rel.	2
Phys. Psych.	1	Internat. Law,	2	Internat. Law,	2
		Hist. Art,	2	Hist. Art.	2

## II. Literature.

Greek (O.)	2	Greek (C.)	2	Greek (C.)	2
English,	2	Latin,	2	Latin,	2
French,	2	German,	2	German,	2
Sanskrit,	2	Sanskrit,	2	Sanskrit,	2

## III. Science.

Math.	2	Math.	2	Math.	2
Pract. Astr.	1 (2)	Pract. Astr.	1 (2)	Pract. Astr.	1 (2)
Physics,	1 (2)	Physics,	1 (2)	Physics.	1 (2)
Lab. Chem.	2 (3)				
Biol. or Pal.	1 (2)	Biol. or Pal.	1 (2)	Biol. or Pal.	1 (2)
Histology,	1 (2)	App. Chem.	1	App. Chem.	1
Hours elect,	<u>6 or 7</u>		<u>6 or 7</u>		<u>6 or 7</u>
Tot. hours,	15 or 16		15 or 16		12 or 13

1. BIBLE, ORATORY and ESSAYS are required throughout the four years.

2. Senior Electives marked 1 (2) occupy one hour per week on the Weekly Schedule, but count as two-hour Electives, on account of extra laboratory and observatory work. Lab. Chem. counts as a three-hour Elective.

# FRESHMAN WEEKLY SCHEDULE.—FIRST TERM.

## WEEKLY SCHEDULES.

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	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.	SATURDAY.
I.	8½	Livy	English	Homer	Greek (W.)	Bible
	10	Algebra	English	Livy	Livy	Euclid 10½
	11	Greek (W.)	Greek (W.) 5	Algebra	Latin Prose	
	3	Elocution				
	4					
II.	8½	Algebra	English	Livy	Euclid	Bible
	10	Latin Prose	English	Algebra	Greek (W.)	Livy 10½
	11	Greek (W.)	Greek (W.)	Homer	Livy	
	3			Elocution		
	4					
III.	8½	Euclid	Livy	English	English	Bible
	10	Livy	Greek (W.)	Homer	Livy	Greek (W.) 10½
	11	Latin Prose	Algebra 5	Algebra	Greek (W.)	
	3				Elocution	
	4					
IV.	8½	Homer	Greek (W.)	English	English	Bible
	10	Livy	Livy	Greek (W.)	Euclid	Latin Pr. 10½
	11					
	3					
	4	Algebra	Algebra	Homer	Greek (W.)	

## FRESHMAN WEEKLY SCHEDULE.—SECOND TERM.

	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.	SATURDAY.
I.	8½ 10 11 3 4 French Homer	Euclid Algebra Livy	French Horace Greek (W.)	Homer Algebra Livy	Greek (W.) Livy Horace	Bible Euclid 10½
II.	8½ 10 11 3 4 French Euclid	Homer Livy Algebra	Livy Horace Greek (W.)	Euclid Livy Homer	French Greek (W.) Horace	Bible Algebra 10½
III.	8½ 10 11 3 4 Homer French	Algebra Horace Livy	Greek (W.) Euclid French	Livy Homer Algebra	Euclid Horace Greek (W.)	Bible Livy 10½
IV.	8½ 10 11 3 4 Homer French	Livy Horace Algebra	Euclid Livy French	Algebra Euclid Homer	Livy Horace Greek (W.)	Bible Greek (W.) 10½



## SOPHOMORE WEEKLY SCHEDULE.—FIRST TERM.

MONDAY.		TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.	SATURDAY.
I.	8½	Latin (P.)	History	Anat. & Phys.	Greek (O.)	Bible
	10					
	11					
	3					
II.	4	Math.	Latin (P.)	Greek (O.)	History	French
	8½					
	10					
	11					
	3	Latin (W.)	History	Greek (W.)	Greek (C.)	Bible
	4					
	Math.					
	Math.					
	8½	French	Latin (W.)	Anat. & Phys.	History	French
	10					
	11					
	3					
	4	Math.	Latin (W.)	Greek (W.)	Greek (C.)	Bible
	8½					
	10					
	11					

## SECOND AND THIRD TERMS.

I.	8½	Latin (W.)	English	Greek (W.)	Greek (C.)	Bible
	10					
	11					
	3					
	4	Math.	Latin (W.)	Zoöl. & Bot.	English	French
	8½					
	10					
	11					
	3	Latin (P.)	English	Greek (O.)	English	Bible
	4					
	Math.					
	Math.					
	8½	French	Latin (P.)	Zoöl. & Bot.	Greek (O.)	French
	10					
	11					
	3					
	4	Math.	Latin (P.)	Greek (O.)	Greek (O.)	Greek (O.)
	8½					
	10					
	11					

One of the Greek exercises is replaced by Botany in third term.

JUNIOR WEEKLY SCHEDULE.—FIRST TERM.

	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.	SATURDAY.
8½	PHYSICS	PHYSICS	PSYCHOLOGY	Latin	Latin	BIBLE
10				Anglo-Saxon	Anglo-Saxon	
11	Greek (W.)	Mathematics	PSYCHOLOGY	Mod. Lang.	Mod. Lang.	ENGLISH
3	Greek (W.)	Greek (W.)			Mathematics	
4	PHYSICS	PHYSICS	Hist. (5 p. m.)	History	ENGLISH	

SECOND AND THIRD TERMS.

	PHYSICS	PSYCHOLOGY <sup>1</sup> LOGIC <sup>2</sup>	PSYCHOLOGY <sup>1</sup> LOGIC <sup>2</sup>	Latin	Latin	BIBLE
8½						
10				Mod. Lang.	Phys. Geog.	
11	Greek (O.)	Mathematics	PSYCHOLOGY <sup>1</sup> LOGIC <sup>3</sup>	Phys. Geog.	Mod. Lang.	ENGLISH
3	Greek (O.)	Greek (O.)			Mathematics	
4	PHYSICS	PHYSICS	History	History	ENGLISH	

<sup>1</sup> Until Feb. 1st.      <sup>2</sup> From Feb. 1st.

## SENIOR WEEKLY SCHEDULE.—FIRST TERM.

MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.	SATURDAY.
8½ Jur. and Pol.	ASTRONOMY	Physics Biology	Comp. Politics	French	BIBLE
10 Pract. Astron.		Metaphysics	Phil. Psych.	Greek (C.)	Paleontology
11 Greek (O.)	ETHICS				
8 Metaphysics					
4 Jur. and Pol.	ASTRONOMY				

## SECOND AND THIRD TERMS.

MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.	SATURDAY.
8½ Jur. and Pol.	ASTRONOMY <sup>2</sup> GEOLOGY <sup>3</sup>	ASTRONOMY <sup>2</sup> GEOLOGY <sup>3</sup>	Int. & Const. Law	German	BIBLE
10 Pract. Astron.			Hist. Phil.	Greek (C.)	Paleontology
11 Hist. Phil.	ETHICS <sup>1</sup>	Sci. and Rel.	Latin	Latin	CHEMISTRY
8 Greek (C.)		Physics Biology	German	Int. & Const. Law	
4 Jur. and Pol.	ASTRONOMY <sup>2</sup> GEOLOGY <sup>3</sup>	Sci. & Rel. His. of Art	Applied Chem.	CHEMISTRY	

1. Through Second Term.

2. Until Feb. 1st. 3. After Feb. 1st.

5 { Sci. & Rel.  
His. of Art

\* An additional class-room exercise to be scheduled by Prof. Cornwall.

Science and Religion mutually exclusive with History of Art.

Mathematics and Sanskrit; hours to be arranged with the professor.

## EXAMINATIONS, STANDING AND GRADUATION.

### EXAMINATIONS.

*Regular Examinations.*—At the end of each term each class is ordinarily examined in the studies of that term. At the close of the third term the examination in certain subjects embraces not only the work of that term, but the course of the entire year.

*Partial Examinations and Written Recitations.*—In addition to the regular examinations, partial examinations or written recitations are held from time to time during the term.

*Divisional Examinations.*—In the Freshman Class, a special examination is held early in the first term, the results of which determine the distribution of the class into graded divisions. These are reorganized at the beginning of the second and third terms, according to the results of the last preceding regular examination.

*General Regulations.*—Examinations are for the most part conducted in writing, but in certain subjects are oral in whole or in part. Private examinations are not allowed except in extreme cases, and by special permission of the Faculty. Absence from an examination, except for reasons of absolute necessity, will be regarded as a serious delinquency, and a subsequent examination will not be granted except by a vote of the Faculty.

#### *Regulations in Respect to the Removal of Conditions.*

Students who shall appear to the Faculty, on examination, to be deficient in their studies, will be dealt with according to the nature and extent of the deficiency. Any member of either of the three lower classes who shall fail to pass the examinations at the end of the first or second term in more than two depart-

ments, shall be dropped from his class and shall be required to enter a lower class or to withdraw from College. If the failure be in not more than two departments, the student may be allowed a second trial at the beginning of the next term; if he fail in this second examination, he shall employ a tutor approved by the Faculty, and be allowed four weeks for further preparation; but if he still fail to pass, he shall be required to enter a lower class or withdraw from College. The same rules shall apply to the examinations at the close of the third term, except that in the case of failure in not more than two departments the student shall be required to pass a satisfactory examination at the beginning of the next Academic year, and will not be allowed additional time for preparation, nor a third trial.

In the Freshman Class, failure with either instructor in Greek, in Latin, or in Mathematics is reckoned as a separate failure in the application of the above rules.

The Senior Class will be subject to the same regulations as the three lower classes so far as regards the examinations at the close of the *first* term, and the removal of any conditions then incurred.

In the application of these regulations, special cases, arising from illness or other causes, will be duly considered.

*On the second day of each term, Thursday, at 10 o'clock A. M., all delinquent or unexamined students are required to meet in the Old Chapel to make arrangement with their instructors for examination in the subjects in which they are deficient. This does not apply to entering students.* In the first term, this examination is to take place immediately at the beginning of the term; in the second and third terms, two weeks are allowed for it. Any student not present as thus directed, or not prepared for examination at the time appointed, will be debarred from another opportunity, except by special vote of the Faculty.

### STANDING.

The results of the term examinations are combined with those of the recitations to decide the relative standing or rank of the student. The maximum mark in each study is one hundred; the minimum or passing mark is fifty. Students falling

below the passing mark in any study are conditioned, and in order to continue with the class must be re-examined.

Each instructor after computing from recitations and examinations the marks of his classes determines each student's rank by assigning him to one of six Groups into which the class is divided. These Groups are constituted and numbered in order of merit—those students whose marks indicate the highest attainments being assigned to the First Group, the next highest to the Second Group, and so on through the six Groups. The First Group is to contain not less than one-thirtieth, nor more than one-tenth of the class; the Second, Third, Fourth, and Fifth Groups, each not more than one-fifth;—and the Sixth Group comprises the remainder of the class, except those not fully examined.

The General Rank of a student is determined by combining his Group-numbers in the several studies in proportion to the allotted schedule time of each. Those students whose averages are highest, and above an established limit, are assigned to the First General Group; those next highest to the Second General Group; and so on, through the Six General Groups.

The First and Second General Groups for the year, of the Junior, Sophomore and Freshman classes, constitute the Honor Groups of these classes and are published in the Catalogue of the following year,—the names included in each Group being printed in alphabetical order.

In determining a student's standing Essays count as one hour per week throughout each of the four years, and account is also taken of attendance and conduct as well as scholarship, according to the published rules of the Faculty.

A report of the standing of each student is made to his parent or guardian by the Registrar of the College at the close of the first term and at the close of the year. The latter report gives also the standing for the whole year.

## GRADUATION.

### *Bachelor's Degree.*

Students who pass their final examination are ordinarily recommended by the Faculty for the Degree of Bachelor of

Arts, and if the recommendation is approved by the Trustees, the degree is conferred at the Commencement and they receive diplomas signed by the President and the Clerk of the Board of Trustees.

No student will be recommended to the Trustees for a degree who fails to pass the examinations at the close of the last term of the Senior year. A student who fails to pass in his final examination in any department will forfeit the title to a degree, and it can only be restored by express vote of the Faculty upon sufficient reasons given, and in accordance with the following regulations :

(1.) Any member of the Senior class failing at the final examination in but *one* of his studies may, by vote of the Faculty, be allowed a re-examination, and if successful in passing this may be recommended to receive his degree with his class.

(2.) Any member of the Senior Class failing to pass the final examination in *two* of his studies may, by vote of the Faculty, be allowed a re-examination, and if successful in this may be recommended for a degree *at some time in the next Academic year.*

#### *Final Rank and Graduation Honors.*

The final rank of members of the graduating class is computed by combining the averages for the several years of the course, and the Faculty then determines the limits of the six General Groups of the graduating class, and also what portion of the class shall be printed as the Honor List,—the names of the members of each group of the Honor List being printed in alphabetical order.

The First and Second General Groups thus determined are the Honor Groups of the graduating class, and are designated *magna cum laude* and *cum laude* respectively.

The higher distinction of *insigni cum laude* and the highest of *summa cum laude* are reserved for very unusual excellence.

#### *Commencement Appointments.*

Commencement orations, indicative of general or special excellence, are awarded by the Faculty to such students as are deemed worthy of distinction. The student whose individual

rank is highest is ordinarily awarded the Latin Salutatory by vote of the Faculty. In like manner the student whose individual rank is the next highest receives the English Salutatory. The Valedictory is awarded with special regard to the qualifications of the student as a Valedictorian, as well as on the ground of scholarship. Orations and Theses designated as Philosophical, Classical, Mathematical, Physical, Metaphysical, Ethical, Historical, Literary, Belles Lettres, French and German, are awarded to students eminent in the corresponding departments.

In the award of all degrees and honors, regard is had to the conduct of the student during his course, and any student who has incurred serious discipline may be debarred from the rank to which otherwise his scholarship would have entitled him.



# T H E JOHN C. GREEN SCHOOL OF SCIENCE. ---

## FOUNDATION AND ORGANIZATION.

This institution is a department of the College of New Jersey, founded in 1873 upon an endowment by Mr. John C. Green.

Its design is to furnish more extended and special instruction in the Natural Sciences, providing a course in General Science for undergraduate students and also various graduate courses. The course in Civil Engineering was added in 1875, by further endowment from the residuary legatees of Mr. Green, and subsequently the elective courses in certain branches of the Natural Sciences were established.

The undergraduate courses offer, according to the choice of the student, efficient education in the Natural Sciences in general, or a thorough training in the study of Civil Engineering and in various other branches of Science, pure and applied. At the same time a liberal education in certain Academic studies is secured to all candidates for a degree.

Graduate courses of study for the degrees of Master of Science and Doctor of Science are provided; and also special courses which, under certain conditions, may be taken by students who are not candidates for any degree.

Instruction is given by lectures and recitations,—by practice in the laboratories, drawing rooms, museums and field,—and excursions are made to different points of interest.

Before receiving his degree every student must present to the Faculty an acceptable thesis on some scientific subject, the nature of which will depend upon the course he has pursued.

## ADMISSION.

### ENTRANCE EXAMINATIONS.

All entering students on their arrival must report at the President's house and register. The first examination for admission will begin in Princeton on Thursday, June 24th, 1886, at 11 A. M., and will continue through the afternoon of Friday. The second will begin on Tuesday, September 14th, at 11 A. M., and continue through the afternoon of Wednesday. *Attendance is required at the beginning of the examination.*

Simultaneously with the June entrance examinations in Princeton, examinations are held in the following cities, viz.: Pittsburgh, Cincinnati, Louisville, Chicago, St. Louis, Omaha and San Francisco; and at preparatory schools and other cities when necessary. The precise places in which the examinations are to be held can be learned by application to the President. Due notice of these examinations will be published in leading local papers for several weeks in advance.

Examinations at other times and places than those specified are very inconvenient and often impracticable, and applicants for admission at other than the regular days are required to pay \$10 into the treasury.

Candidates for admission to the Freshman Class must be at least sixteen years of age. They will be examined in the following books and subjects:

**ENGLISH:** Grammar—Whitney, or Reed and Kellogg (Higher Lessons); Modern Geography—Guyot's Grammar-School Geography; U. S. History—Anderson's or Johnston's; Essay; the theme for 1886 will be based on the Life of Irving or of Goldsmith. The attention of Preparatory Schools is called to the need of a more thorough study of Elementary English. **MATHEMATICS:** Arithmetic entire, including the Metric system, a practical knowledge of which is indispensable; Algebra, through Quadratic Equations of one and two unknown quanti-

ties, including Evolution, Radicals, Theory of Exponents; Geometry, Plane Geometry entire (five books of Chauvenet's Geometry or their equivalent). FRENCH: The Elements of Grammar and the Translation of fifty pages of simple French Prose. PHYSICAL GEOGRAPHY: The Elements, as contained in Guyot's Grammar-School Geography.

Candidates for the degree of Bachelor of Science will be examined (in addition to the subjects above enumerated) in LATIN: Grammar, with special attention to Parsing, and the retranslation from English into Latin of simple sentences from the First Book of Cæsar; Translation, Cæsar (five books of the Gallic War), or equivalents from other Latin authors.

It is recommended that *all* candidates should receive instruction in Free-hand Drawing before their entrance.

NOTE.—Candidates for the degree of Bachelor of Science entering in June, 1887, and thereafter will further be required to pass in the *Translation of four orations of Cicero against Catiline*.

#### OTHER REQUIREMENTS.

Candidates for admission to an advanced class will be examined in the studies previously pursued by the class they propose to enter.

All candidates for admission must bring satisfactory testimonials of moral character, and if the candidate has been a member of another college, university, or similar institution, he must produce a certificate from its President or Faculty that he is free from censure in the same.

No candidate is admitted without an examination and a vote of the Faculty.

Immediately after the opening of the College the entering students meet according to announcement for the registration of their names and subscription to the following pledge, required by the Board of Trustees:

We, the undersigned, do individually for ourselves promise, without any mental reservation, that we will have no connection whatever with any secret society, nor be present at the meetings of any secret society in this or any other College so long as we are members of the College of New Jersey; it being understood that this promise has no reference to the American Whig and Philosophic Societies. We also declare that we regard ourselves bound to keep this promise, and on no account whatever to violate it.

## UNDERGRADUATE COURSES.

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Undergraduate courses are provided for the Degrees of Bachelor of Science, and of Civil Engineer.

Candidates for the degree of Bachelor of Science pursue the course in *General Science* until the end of the first term of the Junior year, after which they may continue in that course, or choose one of the following four Elective Courses : Chemistry and Mineralogy ; Biology and Chemistry ; Biology and Geology ; Mathematics and Mechanics.

In the Senior year students taking the course in General Science, or the elective course in Mathematics and Mechanics, may pursue a select course in Physics, or Practical Astronomy.

The student must announce his election before the end of the first term of the Junior year. He cannot afterwards change his course without the permission of the Faculty.

The course in *Civil Engineering* diverges from that in General Science at the very beginning of the Freshman year.

*Special Students.*—For persons who may desire to devote especial attention to any of the scientific studies of the School, arrangements can be made with the Professors of those branches, if the Professor in charge shall, after due investigation, decide that the applicants can pursue such studies with advantage. Every facility will be offered for their advancement in the studies selected, with the personal supervision of the professor and full access to the collections, etc.; but it must be distinctly understood that this opportunity is intended only for those who desire to obtain proficiency in special branches, and not for students who have failed to keep up with the regular classes. Special students will be required to give evidence of satisfactory progress in their studies. To those passing successful examinations in the branches selected, certificates of proficiency will be given. The branches open to special students include : Geology ; Mineralogy ; Biology ; Physics ; Practical Astronomy ; Analytical and Applied Chemistry ; Assaying ; Topography.

**COURSES FOR THE DEGREE OF BACHELOR  
OF SCIENCE.****COURSE IN GENERAL SCIENCE.**

This course is especially intended to furnish instruction in the Natural Sciences in general, and the required studies of the course are indicated in the synopsis on pp. 102-103. After the beginning of the second term of the Junior year the student pursues, under the direction of the Faculty, elective studies in various branches of science, to occupy the hours not devoted to the required studies.

**STATEMENT OF STUDIES.****Modern Languages.**

PROFESSOR HUSS.

Instruction in Modern Languages comprises German and French as required studies throughout the entire course; the number of exercises being given in the synopsis, pp. 102-103.

In the Freshman year the student begins and completes the etymological part of grammar, both in German and French. The instruction is, at the very outset, conducted with a view to familiarizing the student not only with reading and writing, but also with speaking the foreign idiom; for which latter purpose conversational exercises are constantly resorted to and especial attention is given to pronunciation.

In the Sophomore year the instruction bears on syntax, with oral and written exercises in French and German prose, particular attention being given to the intricacies of the German period.

The Junior year and the first two terms of the Senior year are devoted to a critical study of and lectures on the masterpieces of German and French literature.

**Mathematics.**

PROFESSOR ROCKWOOD.

The Mathematical course, which is the same for all students of the School of Science, is intended to be so framed as to sup-

ply the necessary foundation in knowledge and training for the later studies of Physics and Mechanics, and especially finds its natural continuation in the applied mathematics of the course in Civil Engineering. The fact that the student's mathematical knowledge is thus to be *used* in other departments is carefully kept in view, not only in selecting the subjects to be studied, but in arranging their order and the relative time to be devoted to each, so that he may be properly prepared for the work before him. In this connection also especial mention may be made of the constant black-board practice, which is a prominent feature of the instruction, and gives the student a practical as well as a theoretical familiarity with the processes, preparing him for their ready use afterward in the special investigations of his later studies.

The student is required, at the entrance examination, to be acquainted with Arithmetic, including the Metric System; Algebra through Quadratic Equations, including Radicals and the Theory of Exponents, and with the principles of Plane Geometry as developed in the first five books of Chauvenet's Geometry.

During the whole of the first year the student devotes five hours a week to Mathematics. In the first term he finishes the study of Algebra (Wells), discussing the various forms of Series, the subject of Logarithms and the Theory of Equations.

In the second term Solid Geometry and Spherical Geometry are studied, the text-book being Chauvenet's Treatise, and the subject being illustrated by a numerous and valuable collection of models, mostly from original designs. With the Geometry is combined a thorough course in Mensuration and an introduction to the elements of Modern Geometry. The third term is devoted to Plane Trigonometry, in which the student becomes accustomed to the practical use of Logarithms, and a part of the first term of the Sophomore year is given to Spherical Trigonometry and its applications. The second and third terms of the Sophomore year are devoted to the study of Analytical Geometry, both of the Plane and of Space, with special reference to the Conic Sections. In the first term of the Junior year the Differential and Integral Calculus are studied, with five exercises a week;

and the students in the course in Civil Engineering have a short supplementary course at the beginning of the second term in those more advanced portions of the Calculus which are specially applicable to their work. Throughout the whole course, the black-board drill is combined with abundant oral explanation and occasional formal lectures.

The Calculus ends the course in the Pure Mathematics required of all students. They pass then to the applications of their work in the special departments of Engineering, Physics, Astronomy, etc. Provision is, however, made for the further special study of the subject by the elective course in Mathematics and Mechanics.

### Graphics.

PROFESSOR WILLSON.

**MECHANICAL DRAWING.**—This study occupies thirty-five exercises (two hours each) during the first term of the Freshman year, and embraces instruction in the use of drafting instruments and materials in the various operations of Industrial Science Drawing: such as tinting and shading, both with pen and brush; lettering; the representation of metals, wood, rocks, earth, tiles and other materials of architectural and engineering construction; architectural drawings and tracing of the same, to scale, from measurements. Text-book: Warren's "Drafting Instruments and Operations."

**PLANE PROBLEMS AND ELEMENTS OF DESCRIPTIVE GEOMETRY.**—Instruction in these subjects occupies 39 exercises (two hours each) during the second term of the Freshman year, and embraces:

(a) The construction of the cycloid and other trochoidal curves, of the spirals and of the paths traced by points in link motions.

(b) The orthographic projection of points, lines, surfaces and solids (in the first angle), with problems of sections, interpenetrations and developments relating to the latter, including the five regular solids.

(c) Axonometric (including Isometric) projections, with drawings from models, to scale, from measurements.

(d) Elementary problems of shades and shadows.

(e) Elementary problems of the point, line and plane in the four angles. Text-book : Angel's Practical Plane Geometry and Projection.

**DESCRIPTIVE GEOMETRY.**—This embraces a course of 30 exercises (two hours each), in the first term of the Sophomore year, on developable, double-curved and warped surfaces and trihedrals. Text-books : Warren's Descriptive Geometry ; Angel's Practical Plane Geometry and Projection.

**SHADES, SHADOWS, PERSPECTIVE AND SPHERICAL PROJECTIONS.**—A course occupying 21 exercises (two hours each) in the third term of the Sophomore year. It includes the graphical construction of the shades and shadows of developable, double-curved and warped surfaces ; perspective by the methods of the earlier French writers and also by those adopted in the present practice of American architects ; and, finally, the application of Descriptive Geometry in the more important methods of map projection, as the Stereographic, Mercator's, Polyconic, etc. Text-books : Warren's Descriptive Geometry, Wright's Architectural Perspective. Reference Works : Craig's Treatise on Projections, Germain's Spherical Projections.

**FREE-HAND DRAWING.**—The object of this course is to furnish the training necessary to the making of such sketches or designs as are ordinarily required in the practice of the engineer or biologist. The drawings are, from the first, made directly from the object, and instruction is given in the application of the principles of shadows, shading and perspective. The course occupies all students 15 exercises (two hours each) in the second term of their Freshman year. Students in the Biological Department have an additional course in more advanced work in their Senior year.

**ELECTIVE COURSES.**—Stereotomy (see course in Civil Engineering), may be elected by any student taking the elective course in Mathematics and Mechanics ; and both Stereotomy



and Machine Drawing (see course in Civil Engineering), may, in the Junior and Senior years, be elected by students taking the course in General Science, when no interference with other studies is occasioned.

**DRAFTING ROOM AND MODELS.**—The recitation and drafting room of the department of Graphics is well lighted and furnished with model cases and with desks for the accommodation of ninety-two students. The drawing courses in Descriptive Geometry, Perspective, Shades and Shadows, Architectural Constructions (including Stone-Cutting), Kinematics and Machinery, are illustrated by a large collection of models, which includes a number of duplicates of the Olivier ruled-surface models, two hundred from the Messrs. Schröder, of Darmstadt, complete sets of the mathematical models designed by Professors Brill and Björling, a number of the "Muret" plaster models and several warped surface models from designs by the professor.

### **Surveying.**

**PROFESSOR McMILLAN.**

This course, occupying twenty exercises in the first term of the Sophomore year, is designed to teach the student the outlines, principles and applications of the different subdivisions of Geodesy, and to familiarize him, in a general way, with surveying practice. Field exercises are intermingled with the recitations, and the subject is thus rendered more intelligible and attractive.

### **General Chemistry.**

**PROFESSOR SCHANCK.**

The instruction in this study occupies two hours a week during the Sophomore year, being the same as that in the required course in General Chemistry, of the Academic classes. Students pursuing the course in General Science also attend Professor Schanck's elective course in Applied Chemistry, during the Senior year.

**Analytical Chemistry and Mineralogy.**

PROFESSOR CORNWALL AND DR. MCCAY.

**MINERALOGY.**—The elements of Crystallography are taught by a course of lectures in the second and third terms of the Freshman year. Determinative Mineralogy, with the blowpipe, is taught during the whole of the first term of the Sophomore year, in a course of forty-six exercises (two hours each). In the Senior year a course of lectures on Descriptive Mineralogy, with practice in the determination of minerals by their physical characteristics, together with the optical study of minerals and rocks, may be elected by the students in the course in General Science.

**ANALYTICAL CHEMISTRY.**—During the second and third terms of the Sophomore year, the students attend lectures, with recitations, and also work in the laboratory, pursuing the study of Qualitative Chemical Analysis, with Fresenius's Manual as a guide. Four exercises a week (of two hours each) are given to the study of the detection of bases, together with instruction in the tests for the common acids, inorganic and organic. During the Junior and Senior years instruction in Quantitative Chemical Analysis may be taken as an elective.

**Botany.**

PROFESSOR MACLOSIE.

During the Freshman year Botany is a required study. There are five exercises a week (two hours each), for fourteen weeks. The work of the class is exclusively practical, and includes the examination of plants as to their morphology, histology, modes of development, and physiology. Students are taught to use their hands and eyes, to avail themselves of microscopical appliances, to master the characters of the larger orders of plants, and are exercised in phytography by describing and drawing what they see. The text-books and manuals are used for reference, but each student is required to prepare his own text-book by noting down the results of his own examination of typical plants. Botanical excursions are made in the spring season to

the surrounding districts, and an original thesis on some botanical subject is required of each student. (Books recommended : Macloskie's Elementary Botany ; Gray's Manual of Botany ; Bessey's Briefer Course Botany. Books of reference : Sach's Text-Book of Botany ; Eichler's Blüthendiagramme ; H. Müller's Fertilization of Flowers ; Le Maout and Decaisne's Botany ; Bentham and Hooker's Genera Plantarum ; De Candolle's Prodomus. Also the monographs on special groups of Flowering and Flowerless Plants.)

### **Biology.**

**PROFESSORS MACLOSKIE, LIBBEY AND OSBORN.**

During the Sophomore year all candidates for the degree of Bachelor of Science have an elementary course in Zoölogy, consisting of fifty-two exercises, during the second and third terms. The studies of the second term, under Professors Macloskie and Osborn, consist of lectures and practical work upon the Invertebrates and Vertebrates. In the second and third terms Professor Libbey gives a course in Histology and use of the microscope.

These required courses are introductory to the Elective courses in Biology and Chemistry and Biology and Geology of the Junior and Senior years.

### **Studies Pursued in Common with the Academic Classes.**

The following studies are pursued either together with the Academic classes, or essentially as stated under the corresponding titles in the Academic course, and under the same instructors.

Psychology or Logic, according to the election of the student ; Political Economy ; English Literature, the Essays and Orations required from the Senior class in the Academic course being replaced in the Scientific course by the preparation and reading of Theses on Scientific subjects ; Rhetoric and English Language ; Oratory ; Physics ; Astronomy ; Geology ; Human Physiology and Anatomy.

**SYNOPSIS OF COURSE.**

The required studies of the course in General Science are indicated in the following synopsis, the bracketed figures denoting the number of exercises in each subject :

**FRESHMAN YEAR.***First Term.*

**MATHEMATICS** : Algebra completed (Wells') ; [65]. **ENGLISH** : Trench (Study of Words and Select Glossary) ; Lectures and Essays ; [26]. **MODERN LANGUAGES** : German ; Huss' System of Oral Instruction. [52]. **BOTANY** : Flowering Plants ; Morphology of Plants (Macloskie's Botany) ; [30]. **DRAWING** : Elementary Mechanical Drawing ; [35]. **ORATORY** : Lectures and Drill in Elocution.

*Second and Third Terms.*

**MATHEMATICS** : Solid and Spherical Geometry (Chauvenet) ; Mensuration ; Plane Trigonometry ; [95]. **MODERN LANGUAGES** : German ; Huss' System of Oral Instruction, completed. **FRENCH** ; Delille's Condensed Instruction ; [95]. **BOTANY** : Flowerless Plants ; Herborizing ; Vegetable Histology (Macloskie's Botany ; Bessey's Botany, Briefer Course ; Gray's Manual of Botany) ; [35]. **DRAWING** : Projections and Descriptive Geometry ; [39]. Free-hand ; [15]. **MINERALOGY** : Crystallography ; [25]. **ENGLISH** : Essays.

**SOPHOMORE YEAR.***First Term.*

**DESCRIPTIVE GEOMETRY** ; [30]. **GENERAL CHEMISTRY** : Inorganic ; [26]. **MINERALOGY** : Determinative ; [46]. **HUMAN ANATOMY AND PHYSIOLOGY** ; [13]. **GERMAN** : Syntax. **FRENCH** : Syntax ; also oral and written exercises in either language ; [Modern Languages, 52]. **MATHEMATICS** : Spherical Trigonometry and its applications ; [21]. **SURVEYING** ; [20]. **ORATORY** : Criticism, Declamations, Readings. **ENGLISH** : Essays.

*Second and Third Terms.*

**MATHEMATICS** : Analytical Geometry ; [68]. **SHADES, SHADOWS, PERSPECTIVE AND SPHERICAL PROJECTIONS** (War-

ren); [21]. GENERAL CHEMISTRY: Inorganic; [38]. ANALYTICAL CHEMISTRY: Qualitative Analysis; [76]. ZOOLOGY: [32]. HISTOLOGY; [20]. ENGLISH: Principles of Discourse (Hunt); Lectures on English Language and Style; Essays; [38]. GERMAN: Syntax completed. FRENCH: Syntax completed. Oral and written exercises continued. [Modern Languages; 53].

### JUNIOR YEAR.

#### *First Term.*

MATHEMATICS: Differential and Integral Calculus; [65]. PHYSICS; Elementary Mechanics; Properties of Bodies; Mechanics of Fluids; Heat; [52]. ZOOLOGY: Vertebrates (Packard's Zoölogy; Balfour's Comparative Embryology); [13]. ENGLISH LITERATURE: Chaucer; Lectures; [26]. MODERN LANGUAGES:—German: Lessing.—French: Racine. [26]. PSYCHOLOGY; [26]. ORATORY: Oratorical Analysis; Composition and Delivery.

#### *Second and Third Terms.*

PHYSICS: Electricity and Magnetism; Acoustics; Optics; [57]. ANALYTICAL CHEMISTRY: Quantitative Analysis.\* BIOLOGY: Vertebrates.\* ENGLISH LITERATURE: Lectures; [38]. MODERN LANGUAGES:—German: Schiller; Goethe.—French: Molière; Corneille; [45]. LOGIC, [48]; or PSYCHOLOGY, [9].

### SENIOR YEAR.

#### *First Term.*

ASTRONOMY: General; [39]. GENERAL CHEMISTRY: Applied; [13]. ANALYTICAL CHEMISTRY: Quantitative Analysis.\* BIOLOGY.\* HISTOLOGY; [13]. MODERN LANGUAGES: German: Goethe. French: Victor Hugo. Reading Scientific Prose at sight; [26].

#### *Second and Third Terms.*

ASTRONOMY: General; [12]. GENERAL CHEMISTRY: Applied; [18]. ANALYTICAL CHEMISTRY: Quantitative Analysis.\* BIOLOGY.\* MODERN LANGUAGES: Studies of first term con-

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\*Varies according to other Elective Studies taken.

tinued through the second term ; [26]. **POLITICAL ECONOMY :** [26]. **GEOLOGY ;** [38]. **ORATORY :** Reading of Essays on scientific subjects.

### COURSE IN CHEMISTRY AND MINERALOGY.

This course, which is designed to afford thorough instruction in Analytical and Technical Chemistry, is one of the elective courses ; and students electing it enter upon the special studies of the course at the beginning of the second term of their Junior year. They pursue also the following required studies of the Junior and Senior years in the course in General Science :—Modern Languages ; Political Economy ; Psychology or Logic ; English Literature ; Physics ; Astronomy ; Geology ; Zoölogy ; Drawing ; Oratory.

The remainder of the time during these two years is devoted to the following special studies of this course :—

**QUALITATIVE ANALYSIS.**—This subject, previously pursued so far as stated on page 103, is continued, so as to include the detection of inorganic and organic acids, as well as bases, in complex substances.

**QUANTITATIVE ANALYSIS.**—A full course, including the analysis of chemical and metallurgical products, ores, fertilizers, sugar, water, etc. Volumetric methods are freely used whenever they are appropriate.

**ASSAYING.**—Furnace assay of Ores ; Bullion assays.

**BLOWPIPE ANALYSIS.**—Qualitative (required) ; Quantitative (optional).

**TECHNICAL CHEMISTRY and APPLICATIONS OF CHEMISTRY to Medicine and Hygiene,** including Toxicology, Analysis of Potable Waters, Adulterations of Food, Disinfectants. Lectures and recitations.

**MINERALOGY.**—Descriptive and Determinative (the latter chiefly based upon the physical characters of the minerals).

**LITHOLOGY.**—Descriptive and Determinative, with microscopical examination of typical rocks.

In all of the above subjects the instruction embraces lectures by Professor Cornwall, with recitations upon the lectures and upon portions of the manuals mentioned below, and also laboratory practice (except in Technical Chemistry) under the professor and Dr. McCay. All chemical reactions are fully explained by the use of chemical formulas, and the student must show that he understands the theory of all the operations he performs or describes.

The graduation Thesis presented by the student must embody the result of the student's own work in the Laboratory, whether it be experimental or analytical.

**Text-books.**—Fresenius' Manuals of Qualitative and Quantitative Chemical Analysis; Ricketts' Notes on Assaying; Cornwall's Blowpipe Analysis. Reference is frequently made to other works and to scientific periodicals.

## COURSE IN BIOLOGY AND CHEMISTRY.

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This course is recommended to students who intend afterwards to pursue the study of medicine. Students electing it remain candidates for the degree of Bachelor of Science. The special studies of the course begin with the second term of the Junior year, half of the time devoted to such studies being allotted to Biology and half to Chemistry. For the present year the division is made as follows:

**I. BIOLOGY.**—In this branch Prof. Macloskie gives a series of exercises on the anatomy of type forms of Invertebrate Animals, on Comparative Physiology, and on the Morphology and Embryology of plants. The text-books recommended are: Packard's Zoölogy, Foster's Physiology, Brooks' Handbook of Invertebrate Zoölogy, Huxley on the Cray-fish, Balfour's Comparative Embryology, Leidy's Freshwater Rhizopods, Macloskie's Elementary Botany, Bessey's Botany, Sachs's Botany.

Professor Osborn, with Mr. Rankin and Mr. Peters, conducts two exercises a week during the second and third terms

of the Junior year, and two a week during the second and third terms of the Senior year. This portion of the work is intended as an introduction to the study of Human Anatomy and embraces a thorough course in dissection and study of the skeleton of the Cat and Rabbit, employing the text-books of Parker, Mivart, etc. There is also a course of lectures upon Embryology in third term of each year, with practical work upon the development of the chick and frog.

II. CHEMISTRY.—This part of the course will embrace classroom exercises under Prof. Cornwall and laboratory work under his supervision, with the aid of Dr. McCay. After learning how to make quantitative analyses of a number of simple and complex inorganic substances, by the use of gravimetric and volumetric methods, the students will study the properties of the various typical organic compounds, such as alcohols, carbohydrates, acids, etc., as well as of fats, urea, milk and other bodies of interest to the student of physiological chemistry, and will be trained in the methods of analyzing and estimating the same, reference being made to appropriate manuals and current scientific literature. Lectures will also be given upon the Applications of Chemistry to Medicine and Hygiene, including Toxicology, Analysis of Potable Water, Adulterations of Food, Disinfectants, and similar subjects.

### COURSE IN BIOLOGY AND GEOLOGY.

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The special objects of this course are to qualify students who elect it to become original investigators or teachers of the special branches of Science included in it.

Until the close of the first term of Junior year the studies are not specialized, but are the same as in the course in General Science. The special studies in Biology and Geology begin with the second term of the Junior year. The course embraces the following subjects :

I. ZOOLOGY, during Junior and Senior years, including Comparative Anatomy, Osteology, and Embryology ; 149 exercises. Professor Macloskie.



II. **COMPARATIVE ANATOMY** of the Vertebrates, during Junior and Senior years ; 94 exercises. Professor Osborn, Mr. Rankin and Mr. Peters.

III. **HISTOLOGY**, during second and third terms of Sophomore year ; 20 exercises. Professor Libbey.

IV. **PALÆONTOLOGY** ; Professor Scott.

Instruction is also given in the following branches of Natural History:

Physiology, during Senior year ; 35 lectures. Professor Macloskie.

Geology, during Senior year ; 38 lectures. Professor Scott.

Physical Geography, during Junior year ; 40 lectures and recitations. Professor Libbey.

Botany (optional). Professor Macloskie.

### I. ZOÖLOGY.

In this branch, which occupies the second and third terms of Junior year, and continues during the whole of Senior year (two or three recitations weekly), Professor Macloskie gives a series of practical exercises with recitations on the different groups of Invertebrate Animals, using as type-forms for study, *Amoeba*, *Hydra*, *Planaria*, the Earth-worm, Cray-fish, Cockroach, Mussel and Ascidian ; and on Comparative Physiology, using Huxley's and Foster's text-book, with the actual examination of the structure and functions of the organs. Other text-books used in this course are Huxley's *Anatomy of Invertebrate Animals*, Brook's *Hand-book of Invertebrate Zoölogy*, Huxley on the *Crayfish*, Packard's *Zoölogy*, Mivart on the *Cat*, Flower's *Osteology of the Mammalia*, Parker on the *Shoulder Girdle*, Leidy's *Freshwater Rhizopods of North America*. Balfour's *Comparative Embryology*.

### II. THE COMPARATIVE ANATOMY OF THE VERTEBRATES.

(1) The Birds ; their skeleton, muscles, brain, digestive and vascular systems, as modified for their peculiar habits of feeding and flight. This course is given in Sophomore year. (2) The Mammals ; their Anatomy studied by inter-comparison and by the light thrown upon it by the Anatomy of Reptiles, Fishes

and Birds. This course includes the Elementary Embryology of the Chick and Frog, also the development of the Skull. The course in Embryology follows the early chapters of Foster and Balfour's work, and chick embryos are obtained by means of an incubator. The works of Huxley, Balfour and Parker are employed. The principal feature of the course is the laboratory work and the constant practice in drawing from the specimens and dissections.

### III. HISTOLOGY.

This subject embraces a study of the normal tissues, and covers as wide a range as possible in the vertebrate kingdom. Special attention is directed to the methods of microscopical work, both in the management of the instrument and in the processes of injecting, preserving, staining and mounting specimens, the student being required to perform these operations for himself. The laboratory is open at all hours for private investigation on the part of the student, and material is provided.

The regular exercises are held from 2 to 5 p. m. on Wednesday of each week during the second and third terms of Sophomore year. A fee of \$10 is charged to cover the expense of mounting material, slides, cover glasses, etc.

### IV. PALÆONTOLOGY.

This study extends through the Senior year for those students who elect Biology. It includes practical work in the E. M. Museum, the collections of which offer every facility for the thorough pursuit of this subject. Sufficient undescribed material is in the E. M. Museum to offer those students who desire to take a Palæontological subject for their graduation Theses, abundant opportunity to do so.

### COURSE IN MATHEMATICS AND MECHANICS.

The required studies in this elective course are the same as in the course in General Science, but after the beginning of the second term of the Junior year, students electing the course in

Mathematics and Mechanics will pursue such of the studies named below, and in such order, as may be determined from time to time by the Professor of Mathematics in the School of Science, the Professor of Mechanics and the Professor of Physics.

Rational Mechanics ; Mathematical Theory of Fluid Motions ; Mathematical Theory of Strength of Materials ; Thermodynamics ; Higher Analytical Geometry and Calculus ; Quaternions ; Method of Least Squares ; Graphics.

### COURSE IN CIVIL ENGINEERING.

This course is designed to fit its graduates for entering the profession of Civil Engineering. It also provides for the instruction, in any of its specialties, of the graduates of this College and others who may be found suitably prepared. The course diverges from that in General Science at the beginning, but not to such an extent as to make it difficult to change, if desirable, from one course to the other before the opening of the Sophomore year.

The requirements for entrance to the Freshman Class are the same as in the course for the Degree of Bachelor of Science, except that no examination in LATIN is required. The regular course of study occupies four years, and the degree conferred on graduates is that of Civil Engineer, (C. E.)

### STATEMENT OF STUDIES.

#### Studies Pursued in Common with the Classes in General Science.

The instruction in these studies is the same as stated on p. 95, *et. seq.*, and under the same instructors. Modern Languages (of the Freshman and Sophomore years) ; English Literature ; Rhetoric ; Oratory ; Psychology or Logic (according to the election of the student) ; Political Economy ; Mathematics ; Descriptive Geometry ; Shades, Shadows and Perspective ; Free-hand and Mechanical Drawing ; General Astronomy ; General Chemistry ; Mineralogy (of the Freshman and Sophomore years).

### Technical Studies.

The instruction in these studies is given by Professors McMillan, Brackett, Young, Rockwood, Libbey, Willson, Magie and Smith.

In many of the technical studies of the course in Civil Engineering the instruction presupposes a thorough preliminary training of the student in *Mathematics*. A thorough mastery of the ordinary divisions of this science is, therefore, indispensable to the successful study of such subjects as Mechanics, Physics, etc., which follow it.

Great stress is also laid in this Course on the study of *Graphics* as a Science, both in its general development and in its application to the practice of designers and builders.

**RATIONAL AND APPLIED MECHANICS and the THEORY OF MACHINES.**—The instruction in these subjects covers a wide field of study, beginning with the general discussion of Motions and the action of Forces, and ending with the deduction of practical formulas relating to the strength or ability of different structures; the power, efficiency and strength of hydraulic, steam, and air motors and to the various problems which arise in the practice of Hydraulic Engineers.

In dealing with these subjects, rigidly mathematical treatment is generally used, and higher analysis is freely employed wherever it is expedient; yet proper weight is given to methods of graphic analysis, and the student's attention is especially directed to those problems in which they can be employed with marked advantage.

**EXPERIMENTAL MECHANICS.**—The instruction in this study consists mainly of laboratory work. Its purpose is to familiarize the student with the physical properties of building materials; to teach him by actual experiment how to conduct tests and to deduce therefrom coefficients of strength, elasticity, etc.; how to determine coefficients of hydraulic flow and resistance; and how to gauge, by the aid of indicators and dynamometers, the power of steam and other motors. Under this head come also problems in the erection of structures.

AN ENGINEERING LABORATORY has been provided for this work. It contains the following experimental apparatus :—A torsional testing machine ; a wire and cement tester ; various kinds of current meters and water gauges ; a Worthington water meter ; a contrivance for determining the hydraulic slopes within earthen retaining banks ; a flushing tank ; a reaction wheel and other minor pieces of hydraulic apparatus ; a double acting steam pump ; a locomotive link and valve motion and a ten-horse-power compound engine with condenser, indicators, gauges and a “ Prony ” brake.

The illustrative apparatus of the Laboratory comprises rail sections and joints ; specimens of the products of iron and steel mills and other building materials ; a Sturtevant blower ; models of water-wheels, of trestles and of the details of iron bridge and roof joints, of vaults and arches and a 25-foot iron model of a single track railroad bridge, with a complete outfit of false-works and other appliances for its erection, designed especially for this college.

THE PLANNING AND CONSTRUCTION OF ENGINEERING WORKS.—This is treated in a course of lectures following the study of Applied and Experimental Mechanics. The topics which receive special attention are given in the list of subjects under the heading *Constructions*, p. 116.

Great stress is laid on the application of correct principles and formulas ; on the careful inspection, manipulation and preservation of materials, and on the economic features of various designs and the modes of executing them.

A large collection of lantern slides has been provided for illustrating this course. Among the more important photographic studies are a large number of views in detail of the East River Suspension Bridge at different stages of its progress.

An important feature of this part of the course consists of excursions for the examination of Rolling Mills, Bridge Works, Machine Shops, Water Works, etc. In these visits the class is accompanied by either the Professor or Assistant Professor of the department and every member is required to make full notes of his observations and of the instruction received during the trip.

**PRACTICAL PHYSICS.**—In view of the great importance of the problems of terrestrial magnetism in Geodetic surveys, and also in view of the present and increasing demands upon engineers, arising from the application of electricity as a means of illumination and of transmitting energy, provision has been made for the suitable instruction of the student in these subjects, and all candidates for the degree are required to attain a high standard in them.

**GEODESY.**—The study of *Engineering Field Work* is provided for in the different subdivisions of the course in Geodesy. The structure, adjustment and use of each instrument is made the subject of special attention, and no student is allowed to participate in any extended field operation until he has acquired a certain dexterity in handling the instruments used therein. The instruction in field work, beginning with the measurement of lines and angles, extends through different kinds of surveys in the order of their complexity and ends with problems in Higher Geodesy.

A special feature of the course is the stress laid on the collection and verification of field notes by each student, and on their proper use in the preparation of different kinds of plans, maps and charts of surveys. No error is allowed, in field work or in plotting, which is not within the limits observed in current practice.

Under this head is given special instruction in *Hypsometry*, the subject being presented by means of lectures and numerous demonstrations in the lecture room and the field.

A very full collection of instruments has been provided for the course in Geodesy. It represents the work of twelve different firms of high repute, great care having been used to avoid the duplication of instruments by the same maker.

The collection consists of a twelve inch Geodesy Transit, a large Plane-Table with telescopic Alidade and a Telemeter, Engineer's, Mining and Solar Transits, Wye and "Dumpy" Levels, Surveyors' Compasses, Mercurial and Aneroid Barometers, Sextants, Heliotropes, various forms of Linear Measures, and a large assortment of reconnoitering instruments.

**PRACTICAL ASTRONOMY.**—This is taught in connection with the course in Geodesy, and the students 'become familiar with the most approved methods of determining latitude and longitude, and the true meridian, as well as with astronomical operations in general.

**GEOLOGY.**—This course will occupy two hours a week during the second and third terms of the Junior year, and will be more technical in character than the geological course of the Academic Department, though covering nearly the same ground. Dynamical, Structural and Historical Geology will be treated, but special attention will be given to Structural Geology, including Petrography, with reference to its technical and economical bearings.

The text-book employed will be Geikie's Manual of Geology.

**TOPOGRAPHICAL DRAWING.**—The object of this course is to make the student expert in the execution, in pen work and colors, of finished plans and maps of various kinds of surveys. Except in the necessary preliminary drill, the drawings invariably represent actual surveys made by the different classes. A rigid adherence to the field notes of each survey and a high degree of finish is required in the execution of these drawings.

**GRAPHICS.**—The instruction in Graphics includes the following branches.

*Structure Drawing.* A drawing of plan, elevation, and view, sections and details of some railroad bridge, or other structure of approved modern type, to scale, from measurements.

*Machine Construction and Drawing.* A course of lectures, recitations and practical exercises on the kinematics of machinery, with graphical representation of mechanical movements; theory of link and valve motion; screw propulsion; gearing, including the theory and use of Willis's and Robinson's odontographs; working and finished drawings of machinery, etc.

#### Text-books and reference works :

Weisbach, ... <i>Kinematics and Machinery of Transmission.</i>	Warren, ..... <i>Machine Drawing.</i>
Reuleaux, ... <i>Kinematics of Machinery.</i>	Unwin, ..... <i>Machine Design.</i>
MacCord, ..... <i>Kinematics of Mechanical Movements.</i>	Goodeve, ..... <i>Elements of Mechanism.</i>
Anchincloss, ..... <i>Link and Valve Motion.</i>	Forney, ..... <i>Catechism of Locomotive.</i>
Robinson, ..... <i>Teeth of Wheels.</i>	Zeuner, ..... <i>Treatise on Valve Gears.</i>
Seaton, .. <i>Manual of Marine Engineering.</i>	Sennett, ..... <i>Marine Steam Engine.</i>
	Burgh, ..... <i>Screw Propulsion.</i>

**Stereotomy.** A course on the application of Descriptive Geometry to stone-cutting, practically applied by the student in cutting a voussoir of plaster to given shape by means of templates, patterns, etc., derived from his own drawings. Text-book, Warren's Stone-Cutting.

**THESIS.**—Every Candidate for the Degree of Civil Engineer is required to prepare and submit to the approval of the Professor of Civil Engineering, a design for, or a review of some special machine, structure, or process as a Graduation Thesis.

## SYNOPSIS OF COURSE.

### FRESHMAN YEAR.

#### *First Term.*

MATHEMATICS, ENGLISH, MODERN LANGUAGES AND MECHANICAL DRAWING as in the course in General Science. GEODESY: *The Measurement of Lines*; with common chains and tapes; with city surveyors' chains, tapes and rods; chain surveys and computation of areas. *The Measurement of Angles*; with different kinds of compasses; chain and compass surveying, including the simpler methods of determining the True Meridian and Magnetic Declination. Theory and practice: [30].

#### *Second Term.*

MATHEMATICS, ENGLISH, MODERN LANGUAGES, FREE-HAND DRAWING, PLANE PROBLEMS, DESCRIPTIVE GEOMETRY AND MINERALOGY, as in the course in General Science.

#### *Third Term.*

MATHEMATICS, ENGLISH, MODERN LANGUAGES AND MINERALOGY, as in the course in General Science. TOPOGRAPHICAL DRAWING: Drawings representing the conventional symbols separately and in combination; Lettering; [35].

### SOPHOMORE YEAR.

#### *First Term.*

MATHEMATICS, DESCRIPTIVE GEOMETRY, CHEMISTRY, MINERALOGY, ENGLISH, MODERN LANGUAGES, as in the course in



General Science. TOPOGRAPHICAL DRAWING: The plotting of maps; map of the farm survey begun; [33].

*Second Term.*

MATHEMATICS, CHEMISTRY, ENGLISH, MODERN LANGUAGES, as in the course in General Science. STEREOTOMY: Structure Drawing; [20]. GEODESY: Problems in the partition of lands; surveys of public lands; structure and adjustments of engineers' field instruments; [15]. TOPOGRAPHICAL DRAWING: Map of the farm survey finished; [14].

*Third Term.*

MATHEMATICS, CHEMISTRY, ENGLISH, MODERN LANGUAGES, as in the course in General Science. GEODESY: the measurement of angles with Transits and Theodolites; the computation of lines and angles from the field notes of Triangulations; Leveling for Bench Marks, Profiles and Cross Sections; Topographical surveying. Theory and Practice; [28]. TOPOGRAPHICAL DRAWING: Contour Maps; Drawings of Profiles and Cross Sections; [16]. STEREOTOMY: Structure Drawing; [26]. Shades, Shadows, Perspective and Spherical Projections; [21].

JUNIOR YEAR.

*First Term.*

MATHEMATICS, PHYSICS, ENGLISH, PSYCHOLOGY, as in the course in General Science. GEODESY: Measurement of heights with Barometer and Thermometer; Hydrography; Surveying with the Stadia and Gradienter; Solar Compass; Town, Plane-Table and Mine Surveying. Theory and Practice; [60].

*Second and Third Terms.*

PHYSICS, ENGLISH, LOGIC or PSYCHOLOGY, as in the course in General Science. MECHANICS: Analytical Mechanics of Solids and Fluids; [76]. GEODESY: Preliminary and Location Surveys of Routes; Staking out for Construction. Theory and Practice; [30]. TOPOGRAPHICAL DRAWING: Hydrographic Charts; Town Maps; Plans and Profiles of Mines; Colored Topography; Maps of Landscape Surveys; [72]. GEOLOGY; [38].

**SENIOR YEAR.***First Term.*

**GENERAL ASTRONOMY**, as in the course in General Science. **APPLIED MECHANICS**: Elasticity and Strength of Materials; Theory of Stresses in Roofs and Bridges; [90]. **STEREOTOMY**: Machine Construction and Drawing [28]; Stone Cutting, Theory and Plates; [24]. **PRACTICAL ASTRONOMY**, as in Elective course of Academic Department; [15].

*Second and Third Terms.*

**GENERAL ASTRONOMY**, as in the course in General Science. **APPLIED MECHANICS**: Stability of Walls and Arches; Practical Hydraulics; [49]. **MACHINES**: General Theory; Hydraulic Motors; Theory of Steam and Air Engines; [60]. **CONSTRUCTIONS**: Materials of Structures; Dressing and Preservation of Materials; Foundations; Details of Roofs and Bridges; Construction of Roads, Railroads, Canals and Tunnels; Water Supply and Drainage; Heating and Ventilation; [80]. **TOPOGRAPHICAL DRAWING**: Preliminary and Final Drawings of Routes; [25]. **GEODESY**: Higher Geodesy; [15]. **PRACTICAL ASTRONOMY**, as in Elective course of Academic Department; [15]. **PRACTICAL PHYSICS**: Advanced study of Terrestrial Magnetism and Electro-dynamics; [80].

**NOTE.**—It will be noticed that the above list of studies does not provide for regular instruction in the Modern Languages after the Sophomore year. It is, therefore, necessary to explain that a partial equivalent for such instruction has been provided by the use of French and German books of reference in some of the technical courses of the Junior and Senior years.

## EXAMINATIONS, STANDING AND GRADUATION.

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### EXAMINATIONS.

Regular Examinations ordinarily take place at the end of a term; each class being examined in the studies of the term. Occasionally, when a course of study is finished before the close of a term, the examination takes place when that study is completed; but such examinations are not allowed to interfere with the regular exercises in other studies.

Examinations are for the most part conducted in writing, but in certain subjects are wholly or partly oral. Private examinations are not allowed except in extreme cases, and by special permission of the Faculty. Absence from an examination, except for reasons of absolute necessity, will be regarded as a serious delinquency, and a subsequent examination will not be granted except by a vote of the Faculty.

#### *Regulations Concerning the Removal of Conditions.*

The minimum mark for passing examinations is sixty in every department, the maximum mark being one hundred.

A student whose mark is below fifty in more than two departments is dropped from his class.

Other students who have been conditioned, or who, from any cause, have not passed the examinations in the studies of any department, will meet in the old Chapel, on the second day of the following term, at 10 A. M., prepared for an immediate examination in those studies.

Those who then fail may, by permission of the Faculty, have another examination, not later than the end of the first month of the term. Of the students who are still found deficient, only those who have shown great industry during the term in which the re-examinations were held, and who, in

the opinion of the Faculty, are able to keep up with their respective classes, may be allowed to continue with the same, until the close of the college year.

All conditions standing against a student at the end of the college year must be removed within the week after the opening of the next term. Failing to remove such conditions, the student will be required at once to join the next lower class.

### **STANDING.**

The results of the term examinations are combined with those of the recitations to decide the relative standing or rank of the student during the term. In computing ranks, each study, elective or required, is estimated relatively to the others according to the number of hours which it occupies in the weekly schedule of lectures and recitations. The conduct of the student and his attendance also affect his standing. The maximum mark in each department is one hundred; the minimum, or passing mark, is sixty. A student whose average, as determined by the combination of his examination and recitation marks, falls below sixty, is conditioned, and in order to continue with his class must be re-examined. A report of the standing of each student is made to his parent or guardian by the Registrar of the College at the close of the first term and at the end of the year. The last report gives the student's standing for the year.

The final rank of a student is calculated from all the marks received by the student during his College course.

### **GRADUATION.**

Students who have fulfilled the requirements of the Undergraduate Courses, passing satisfactory examinations in all their studies and presenting an acceptable graduation Thesis, are ordinarily recommended by the Faculty for the Degree attached to the course they have pursued, and if the recommendation is approved by the Trustees they receive diplomas signed by the President and the Clerk of the Board of Trustees.

The graduation Thesis will be publicly read and defended by the student during Commencement week.

## GRADUATE COURSES

### IN THE

### ACADEMIC AND SCIENTIFIC DEPARTMENTS.

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Provision has been made for courses of instruction open to resident graduates of this and other Colleges, under the following regulations :

Every instructor in the College shall be at liberty, with the leave of the Faculty, to give instruction to graduates. He shall meet with his class for at least one hour a week, and not more than three hours a week, during the Academic year, and shall require the members of his class to undergo rigid examinations on the course pursued.

Each graduate student attending instruction regularly, and passing the examinations, is entitled to a certificate stating what he has done, signed by the President in behalf of the college.

Students by pursuing these courses may also qualify themselves for the degrees, Master of Science, Doctor of Science, or Doctor of Philosophy, according to the regulations prescribed under *Doctor's and Master's Degrees*.

Each graduate student shall pay twenty-five dollars for every course of instruction that he enters requiring an hour per week (provided no student shall pay more than an undergraduate), and shall defray whatever expense may be incurred by the use of instruments and materials employed by him. This charge may be remitted in whole or part where the circumstances of the student require it. All undergraduate courses of lectures or instruction are also open to graduate students without the payment of any fees except for material used.

Arrangement for the graduate courses should be made by application to the individual instructors.

Graduate courses in the following subjects are announced for the present year : Contemporary Philosophy, Plato and his

Philosophy, Law, Latin, Sanskrit, Physics, Higher Mathematics, Theoretical Astronomy, Biology. The above courses are conducted by advanced lectures or instruction.

A course of Select Readings in Modern Philosophy will be offered to graduates in 1886-7.

Opportunity is also offered to graduates for work in the following subjects, in connection with the regular undergraduate courses : Anglo-Saxon, English Literature, Psychology, History of Philosophy, Metaphysics, History of Art, Geology, Mineralogy, Biology, Physics, Practical Astronomy, Analytical and Applied Chemistry, Assaying, Topography.

### GRADUATE COURSES.

#### Discussions in Contemporary Philosophy.

This class meets once a week and is conducted by the President, who after every two lectures presides at a discussion. The principal speculative questions of the day, those which raise up doubt and difficulties in young minds, are taken up. No. I of Dr. McCosh's *Philosophic Series : On the Criteria of Diverse kinds of Truth*, is used, not so much as a text-book as a guiding thread in the lectures and discussions. He treats of the theories of Knowledge, including Realism, Idealism and Agnosticism, and gives the tests of every kind of truth ; (1) of First Truths : Self-Evidence, Necessity and Universality ; (2) of Reasoned Truths : the Syllogism, with an explanation of the Joint Dogmatic and Deductive Method ; (3) of the Inductive Method, with its Canons ; (4) of the Joint Inductive and Deductive Method. He applies the principles thus derived first to Physica, and inquires What is the nature of, and what are the limits to Development, and secondly to Ethics and Religion, inquiring What is the character of our World, Optimist? Pessimist? Meliorist? or what?

#### Plato and His Philosophy.

This course, conducted by Professor Orris, is on the writings and Philosophy of Plato, as follows : Plato's Republic, alternating with his Theætetus ; Analysis of his Higher Dia-

logues ; Lectures and Dictation, on his Philosophy and Teachings ; Instruction in the Language.

### **History.**

Professor Sloane conducts one exercise a week throughout the first and second terms. Subject : Historical Methods and Historical Systems.

### **Latin.**

Professor Packard reads with a graduate class, selections from the following Latin works : Cicero's philosophical writings, Seneca's Moral Epistles, Tertullian and Augustine ; or Early Sources of Roman Law.

### **English and American Literature.**

A graduate course in English Literature will be given by Professor Murray in 1886-7.

### **Sanskrit.**

Post-graduate students may begin Sanskrit with the Senior Elective Class, or continue studies already begun. For outline of course see p. 64.

### **Physics.**

These courses afford opportunity for advanced work in the laboratory and for the study of Theoretical Physics. In the laboratory the student is either conducted through courses covering general topics, such as Heat, Optics, or Electricity, which are similar to the courses of the Senior year, but more extended and exhaustive in their character ; or, if he so desires, is encouraged to undertake for himself the investigation of special topics. In the theoretical courses the student reads, for a general survey of the subject of Mathematical Physics, some standard text-book, such as Jamin and Bouty's *Traité de Physique*, and for the mathematical theory of the particular subject he is working upon, special treatises, such as Fourier's *Analytical Theory of Heat*, Verdet's *Théorie Mécanique de la Chaleur*, Verdet's *Leçons d'Optique Physique*, Mascart and Joubert's *Electricity and Magnetism*, Maxwell's *Electricity and Magnet-*

ism, Kirchhoff's Mechanik, &c. Professors Brackett and Magie conduct these courses.

### **Higher Mathematics.**

The graduate courses this year are in Differential Equations and in Higher Algebraic Curves and Surfaces. They are based on the treatises of Forsyth and Boole, and Salmon and Clebsch, respectively. In connection with them important parts of the elementary theory of Analytical Functions are studied. Professor Fine conducts these courses.

### **Astronomy.**

This course is conducted by Professors Young and McNeill. It consists of:

(a) Practical Astronomy—the same as in the Senior elective, previously described in the course of study of the Academic Department. This is open to such graduates as did not take it in their College course.

(b) Theoretical Astronomy—one hour weekly through the year. This course consists in the reading of Watson's Theoretical Astronomy, supplemented by selections from Oppolzer and Klinkerfues, and includes the calculation of the orbit of a planet or comet from actual observation.

### **Biology.**

A thorough advanced course in Biology has been established in connection with the Geological, Zoölogical, Botanical, and Chemical departments, the objects in view being (1) to foster a spirit of original research, (2) to qualify advanced students to become teachers. This course is open to College graduates, also to students presenting diplomas from recognized medical schools.

It is open also to students who are not qualified to become candidates for a degree, but who possess sufficient elementary knowledge to profit by the instruction.

The following subjects of instruction are arranged for:



Professor Macloskie—I. Anatomy and Embryology of the Higher Invertebrates. II. Vegetable Morphology and Histology.

Professor Cornwall—Physiological Chemistry.

Professor Libbey—I. The Microscope and Microscopic Technology. II. Histology. III. Deep Sea Soundings and Dredging; recent methods and results.

Professor Osborn—I. Comparative Anatomy of the Vertebrates. II. Elements of Embryology. During the current year Professor Osborn's courses will be taken by Professors Macloskie and Scott and Messrs. Rankin and Peters.

Professor Scott—I. Vertebrate and Invertebrate Palaeontology. II. Advanced Embryology.

These courses are of a comprehensive and elastic character, and, according to the requirements and wishes of different students, include much laboratory work under the direction of the instructor. At the close of the first term, the student may select a department of special study for his Thesis, which must present the results of original work. If the student pass all his examinations at the close of the year and his Thesis be satisfactory to the Board of Instructors, he will be entitled to the degree of Master of Science (M. S.). Attached to the Diploma will be a statement that the degree has been awarded for proficiency in Biology. The Theses which are accepted as giving title to a degree on the recommendation from the Board of Instructors, will be published in the Bulletins or Memoirs of the E. M. Museum.

# THE COLLEGE OF NEW JERSEY.

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The College originated by Royal Charter under President Dickinson in 1746. A second more ample charter was granted in 1748. After the war of the Revolution, the charter was confirmed and renewed by the Legislature of New Jersey.

The College embraces a Board of Trustees and a Faculty of Instruction with certain additional officers employed in the administration of affairs. The undergraduate Societies and Alumni Associations, though not strictly parts of the organization of the College, are fostered by it, and coöperate with it.

The Corporation is styled "The Trustees of the College of New Jersey." By its charter it holds and administers the property of the College, appoints the President and Faculty, makes laws for the government of the Institution, and confers the degrees. The Board is a self-perpetuating body, composed of twenty-seven members, with the Governor of the State as President *ex officio*, or, in his absence, the President of the College.

The Faculty, consisting of the President, the Professors and Tutors, conducts the instruction and discipline of the College, aided by Instructors and Lecturers.

## ALUMNI ASSOCIATIONS.

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### ALUMNI ASSOCIATION OF NASSAU HALL.

Founded 1826.

1st President—JAMES MADISON, of Virginia, Class of 1771.

*President.*

Rev. JOHN MACLEAN, D.D., LL.D., '16, Ex-President of the College.

*Vice-Presidents.*

GEORGE MACLEAN, M.D., '24, Jos. T. THOMAS, Esq., '35,  
PARKE GODWIN, Esq., '34, WILLIAM PATTERSON, Esq., '35.

*Secretaries.*

Prof. JOHN T. DUFFIELD, D.D., '41.

Prof. HENRY C. CAMERON, D.D., '47.

Meets in the Chapel at 1 P. M. the day before the Annual Commencement, and dines in University Hall. Membership includes all graduates of Princeton College.

**PRINCETON COLLEGE ALUMNI ASSOCIATION OF NEW YORK.**

*President.*

JAMES W. ALEXANDER, '60.

*Vice-Presidents.*

THOS. N. McCARTER, LL.D., '43, J. COLEMAN DRAYTON, '78.

*Secretary.*

RUDOLPH E. SCHIRMER, '80, 35 Union Square.

*Treasurer.*

M. TAYLOR PYNE, '77.

Annual Meeting in May.

**PHILADELPHIA ALUMNI ASSOCIATION OF PRINCETON COLLEGE.**

Founded May 1868.

*President.*

HON. BENJ. HARRIS BREWSTER, LL.D., '84.

*Secretary.*

GEORGE FREDERICK KEENE, Esq., '66, 425 Walnut St., Phila.

*Treasurer.*

JOSIAH R. ADAMS, Esq., '78.

Annual Meeting, second Tuesday in December.

**ALUMNI ASSOCIATION OF THE COLLEGE OF NEW JERSEY,  
FOR THE DISTRICT OF COLUMBIA AND THE  
SOUTHERN STATES.**

Founded 1872.

*President.*

HARVEY LINDSLY, M.D., LL.D., '20.

*Secretary.*

JOHN H. VOORHEES, Esq., '41, cor. 9th and F Sts.,  
Washington, D. C.

*Treasurer.*

A. B. KELLY, Esq., '70.

Annual Meeting, third Thursday of January.

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**PRINCETON ALUMNI ASSOCIATION FOR THE NORTHWEST.**

*President.*

CLINTON C. CLARKE, Esq., '60.

*Secretary.*

WALTER BUTLER, Esq., '52, Box 43, Chicago, Ill.

*Treasurer.*

FRANK H. MATTHEWS, Esq.

Meets in November or December, as appointed by Executive  
Committee.

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**PRINCETON ALUMNI ASSOCIATION OF WESTERN  
PENNSYLVANIA.**

*President.*

JAMES LAUGHLIN, JR., '68.

*Secretary.*

SAMUEL C. REA, Esq., '75, Pittsburgh, Pa.

*Treasurer.*

WILLIAM SCOTT, Esq., '68.

Annual Meeting, last Tuesday of August.

**PRINCETON ALUMNI ASSOCIATION OF CINCINNATI.**

Founded 1878.

*President.*

COL. JAMES W. ABERT, '38.

*Secretary.*

FRANK H. KEMPER, Esq., '78, W. 4th St., Cincinnati.

*Treasurer.*

P. A. REECE, Esq., '75.

Annual Meeting, second week in April.

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**PRINCETON ALUMNI ASSOCIATION OF ST. LOUIS.**

*President.*

HON. S. M. BRECKENRIDGE, LL.D., '45.

*Vice-President.*

DABNEY CARR, Esq., '52.

*Secretary and Treasurer.*

K. D. MELLIER, Esq., '69, 709 Washington Avenue, St. Louis.

Annual Meeting, in April.

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**PRINCETON-COLLEGE ALUMNI ASSOCIATION OF THE  
PACIFIC COAST.**

*President.*

REV. A. WILLIAMS, '29.

*Secretary.*

REV. FREDERICK E. SHEARER, '62, San Francisco, Cal. .

Meets annually.

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**PRINCETON ALUMNI ASSOCIATION OF OMAHA.**

Founded 1884.

*President.*

PROF. C. M. DES ISLETS, '68.

## COLLEGE OF NEW JERSEY.

*Secretary.*

REV. T. C. HALL, '79, Omaha, Neb.

*Treasurer.*

LEONIDAS P. FUNKHAUSER, '78.

Annual Meeting, in April.

## PRINCETON ALUMNI ASSOCIATION OF LOUISVILLE, KY.

*President.*

THOMAS D. DAVIDSON, Ph.D., '48.

*Secretary.*

PROF. JOHN G. CECIL, '76.

*Treasurer.*

CLIFTON RODES BARRET, '81.

## PRINCETON ALUMNI ASSOCIATION OF NORTHWESTERN PENNSYLVANIA.

*President.*

JAMES D. STRAWBRIDGE, M.D., '44.

*Secretary.*

SALOMON S. SCHULTZ, M.D., '52, Danville, Pa.

*Treasurer.*

REV. ALEXANDER HENRY, '70.

## THE PRINCETON ALUMNI ASSOCIATION OF LONG ISLAND.

*President.*

REV. HENRY J. VAN DYKE, D.D., '73.

*Vice-President.*

REV. JAMES H. DARLINGTON.

*Secretary.*

REV. N. WOOLSEY WELLS, '72.

*Treasurer.*

Prof. WILLIAM J. NEVIUS, '29.

**PRINCETON ALUMNI ASSOCIATION OF MARYLAND.**

Founded 1885.

*President.*

H. P. C. WILSON, JR., M. D., '48.

*Secretary.*

R. W. JOHNSON, M. D., '76, 64 Franklin Street, Baltimore, Md.

*Treasurer.*

CHARLES J. BEASTEN, '61.

Annual Meeting in January.

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**DOCTOR'S AND MASTER'S DEGREES.**

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**MASTER OF ARTS.**

The degree of A. M. may be conferred, two years after graduation, upon any Bachelor of Arts who shall have devoted one of the years exclusively to study in the College under the care of the Faculty, passing rigid examinations upon the studies pursued; or, who shall have taken at least one graduate course each year for the two years and passed satisfactory examinations upon his work.

The same degree may be conferred, three years after graduation, upon any Bachelor of Arts who is pursuing one of the learned professions (including teaching), or who, on or before May 1st, of the year in which he seeks the degree, shall have submitted to a committee appointed by the Board of Trustees, a satisfactory paper, literary, philosophical or scientific.

## MASTER OF SCIENCE.

Bachelors of Science who shall have devoted one year in this College exclusively to the study of such of the following subjects as the Faculty shall prescribe, and who shall have shown satisfactory proficiency therein by dissertations and examinations, may apply for the degree of Master of Science (M. S.). The prescribed subjects are:—*Biology, Mathematics, Rational and Applied Mechanics, Practical Astronomy, Applied Chemistry, Qualitative Analysis, Quantitative Analysis, Physics, Mineralogy, Drawing, Modern Languages.*

Any Bachelor of Arts, who after examination may be found to be prepared to pursue a graduate course in Science, may become a candidate for the Degree of Master of Science on the same conditions as a Bachelor of Science.

## DOCTOR OF PHILOSOPHY.

A Bachelor of Arts who has devoted all his time to a two years graduate course in the College, taken a prescribed course of special reading, passed a rigid examination on subjects studied and presented a thesis giving evidence of original research and high attainment, may apply for the degree of Doctor of Philosophy.

## DOCTOR OF SCIENCE.

A Bachelor of Arts or of Science, who has devoted all his time to a two years graduate course of scientific studies in the College, passed rigid examinations on the subjects studied and presented a thesis containing the results of original research, may apply for the degree of Doctor of Science.

## HONORARY DEGREES.

The Degrees of Doctor of Divinity (D.D.) and Doctor of Laws (LL.D.) are conferred solely *honoris causa*; the other degrees above named, excepting only the degree of A. B., are, also, sometimes conferred in the same manner.



## FELLOWSHIPS, COMPETITIVE SCHOLARSHIPS AND PRIZES.

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Besides the degrees and honors conferred in the regular course, annual Fellowships, competitive Scholarships and Prizes\* are offered as special incentives to study, in the classes or departments with which they are connected.

Only matriculated students who are candidates for a degree are admitted to the competition for Fellowships, Prizes and Scholarships, and no one is admitted to such competition who has failed to pass satisfactorily his last preceding examination in any of the departments.

No member of any class is allowed to compete for more than one of the Fellowships or Scholarships offered to that class.

The names of the Fellows, Scholars and Prizemen of each year are included in the Honor List for the year.

### FELLOWSHIPS.

Every competitor must have been a member of the College in full standing for at least two Academic years previous to the Fellowship examinations.

No student whose final rank for scholarship is below the Third General Group can be a competitor for any Fellowship; and no student can be a competitor for the Fellowship of any particular department whose rank for the last two years of his course is below the Second Group in that department.

Every Fellow obtaining any one of the \$600 Fellowships must devote his whole time for one year to study in the department for which the Fellowship is provided, under the direction of the Professors in that department. He must reside in Prince-

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\*For Endowed Scholarships see page 152.

ten, and pass two rigid examinations on his work, unless by a vote of the Faculty he be allowed to study at an approved foreign University, in which case he shall from time to time furnish written reports of his work to the Professors in his department. The result of every examination and the reports of work done abroad shall be immediately reported to the Faculty. If resident in Princeton, he shall be allowed to occupy free of cost in one of the College buildings a room assigned to him by the College authorities. He shall be regarded, while occupying such place, as a resident officer of the College, and shall perform such duties in preserving order and decorum in the college edifices as the President and Dean shall assign. He shall also when called on, perform such duties in the department to which he belongs as may be assigned to him by the President at the request of the Professors in that department.

#### THE CHANCELLOR GREEN MENTAL SCIENCE FELLOWSHIP.

This Fellowship, originally founded in 1870 upon the annual payment of \$600 by the late ex-Chancellor Henry W. Green, was permanently endowed in 1878 by a gift of \$10,000 by his widow.

The income of this fund, to be paid quarterly, will be awarded to that member of the Senior Class who shall write the best essay on *The Physiological Utilitarianism of Herbert Spencer*, (to be given in on or before June 1), and who shall stand highest at a special examination to be held in June, on the following subjects:

A general knowledge of the Philosophies of Plato, Aristotle, Descartes, Locke, Leibnitz, Hume, Kant and Hamilton. Cicero De Officiis, Book III.; *De Contentione Honesti et Utilis*. Theoretical Ethics, Psychology and Metaphysics (McCosh's *Intuitions*, Parts I., II., III., Book 1). The Syllogism, and Induction.

Subject of Essay for 1886-7 is, *Theories of Knowledge, with an examination of Realism, Idealism and Agnosticism*.

#### THE CLASSICAL FELLOWSHIP.

The Classical Fellowship has been, for a time, without funds. The sum of \$600, payable quarterly, was previously awarded to

its successful competitor. A portion of that sum, and probably the full amount, will be awarded to that member of the Senior Class who shall stand highest at a special examination, to be held in June, 1886, on the following subjects :

#### IN GREEK.

Translation from English into Greek. Translation of Prose Greek at sight. The *Alcestis* of Euripides, Aristophanes' *Knights*, Plato's *Charmides* and *Lysis*. The Philosophy of Plato.

#### IN LATIN.

Translation from English into Latin. Translation of Latin at sight. Cicero *De Natura Deorum*, and The Relations of Roman Philosophy to Roman Religion. History of Latin Literature.

#### THE CLASS OF 1860 EXPERIMENTAL SCIENCE FELLOWSHIP.

This Fellowship was founded in 1870 upon the sum of \$10,000 subscribed by the Class of 1860. A deficiency of income, resulting from the depreciation of the value of the securities in which the principal was invested and the lowering of the rate of interest, is paid, by the consent of the donor, from the income of the Magee Professorship of Mining and Engineering, founded by George J. Magee, Esq., of the Class of 1860.

The sum of \$600, to be paid quarterly, will be awarded to that member of the Senior Class who shall stand highest at a special examination, to be held in June, on the following subjects, viz: 1. The Theory of Heat. 2. (a.) The Geology and Chemistry of Mineral Veins and Ore-Deposits. (b.) The History of Fossil Birds and Reptiles. 3. Glass and Pottery.

#### THE J. S. K. MATHEMATICAL FELLOWSHIP.

The J. S. K. Fund was established in 1873 upon the sum of \$11,000, given by a gentleman in New York, \$600 of the income of which is devoted to this Fellowship, and \$200 to the Freshman First Honor Prize.

This sum of \$600, to be paid quarterly, will be awarded to that member of the Senior Class who shall stand highest at a

special examination to be held in June, on the following subjects : Analytical Geometry ; Differential and Integral Calculus.

#### THE BOUDINOT FELLOWSHIPS.

These Fellowships are founded upon a bequest of the late Dr. Elias Boudinot, of New Jersey, and yield each the annual sum of \$250.

THE HISTORICAL FELLOWSHIP.—The sum of \$250, to be paid quarterly, will be awarded to that member of the Senior Class who shall write the best essay on the question—*Can the Monroe Doctrine be defended as a statement of Political Principle?*—and pass the best examination in June next on—The Political History of the United States to the War of 1812. The Essay to be presented on or before June 1.

The general subject of examination in 1887 will be : The Relations between the General Government and the Bank of the United States. The Essay will be on—*The Dissolution of the Whig Party.*

The Fellow shall from time to time during the following year, as may be required by the Professor of History, give evidence by written papers that he is pursuing an approved course of historical investigation.

THE MODERN LANGUAGE FELLOWSHIP.—The sum of \$250, to be paid quarterly, will be awarded to that member of the Senior Class who shall pass the best Examination in June, on the following subjects :

A comprehensive knowledge of the French and the German descriptive grammars. Also, the origin and historical development of these languages. In Literature—The mediæval epics of France and Germany, with the sources of their inspiration. Moreover, their lyrical poetry and its representatives ; the leaders of the classical drama in France in the 17th century ; the current of thought in the 18th century—its exponents and results. A comparative view of Germany's intellectual state before and after the Reformation. Significance of the "Sturm und Drang Period" with its chief participants. The current of

thought in Germany from the time of her mental emancipation from foreign influences to the present day. Reading at sight of any given author of the Classical or the Recent Period. An essay of not less than four pages (foolscap) in one of these languages. The examination will be conducted both orally and in writing.

The fellow shall from time to time during the following year, as may be required by the Professor of Modern Languages, give evidence by written papers that he is reading such a course as the Professor may approve.

#### THE E. M. BIOLOGICAL FELLOWSHIP.

The Biological Fellowship will be awarded to that student who shall stand highest at a competitive examination on subjects assigned by the Professors of the Biological department.

The competition for this Fellowship will be open to any member of the Senior Class in either the Academic or Scientific department, or to any College graduate who shall have pursued, during the preceding year, the graduate course in Biology at Princeton, and who shall, in the opinion of the examiners, be deemed competent to pursue the subject advantageously.

This Fellowship conveys the use of a table in the National Seaside Laboratory at Wood's Holl, Mass., together with all the facilities afforded for the collection and study of animal life during the season favorable for such investigations. In the winter months following this laboratory work, the Fellow will pursue his studies at Princeton, and will be required to prepare and submit a thesis embodying the results of his summer researches.

The examinations for this Fellowship in 1886 will be held in June upon the following subjects :

1. *The Structure of the Vascular Cryptogams and Bryophytes.*
2. *The Anatomy and Embryology of the Echinoderms.*
3. *The Anatomy and Embryology of the Selachians.*
4. *The Histology of Muscular Tissue.*

**PRIZES AND COMPETITIVE SCHOLARSHIPS.**  

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**ALEXANDER GUTHRIE McCOSH PRIZE.**

The interest of \$1,000 will be given to that member of the graduating class who shall be adjudged by the Professors of Mental and Moral Science to have written the best thesis on Mental Philosophy, giving evidence of scholarship or original research. The essay is to be given in to the President of the College within one year after the writer of it graduates ; that is, for the present year, on or before June 12, 1886.

**THE LYNDE PRIZES.**

Three prizes—the income of \$5,000, contributed by Charles R. Lynde, Esq., will be awarded by a committee appointed by the Faculty, to the three successful competitors in a debate on the Monday evening preceding Commencement. The competition will be among six members of the Senior class—representatives of the Literary Societies—selected by committees appointed by the Societies respectively, from their own members in the Faculty.

**THE BAIRD PRIZES.**

Through the liberality of Charles O. Baird, Esq., the following prizes, representing the income of \$6,000, will be given to those who excel in the Oratorical Exercises of the Senior class, viz., The Baird Prize of \$100, to the best speaker of those who, during the last three years of the College course, have ranked among the first six writers in any two of the three departments of English Literature, Rhetoric and Oratory ; a prize for Oratory of \$50, to the best speaker exclusive of the Baird Prizeman, of those who, during the same time and in the same departments, have ranked among the first twelve writers ; a Prize for delivery of \$30 to the best speaker exclusive of the two just mentioned ; also, a prize for Poetry of \$50 ; and two Prizes of \$40 and \$30, respectively, for the best and the second best written Disputations.

**THE CLASS OF 1859 PRIZE.**

The interest of \$2,000, given by the Class of 1859, will be awarded to that member of the Senior Class who shall write the best essay on *The Plays of Philip Massinger*, and pass the best examination on Shakespeare's *Henry V.* The essay must be handed in on or before June 1, and the examination will be held in June.

N. B.—The subject of the essay for the Class of 1887 will be *Macaulay as an Essayist and Historian.*

**SCIENCE AND RELIGION PRIZE.**

A medal of the value of \$100 (or its equivalent in money), will be awarded to that member of the Senior Class who shall pass the best examination in the department of the Harmony of Science and Revealed Religion, and write the best essay on *Creation and Evolution.*

**THE GEORGE POTTS BIBLE PRIZE.**

The yearly interest of \$1,000, given in 1867 by Mrs. Sarah A. Brown, expended in the purchase of two copies of Matthew Henry's Commentary on the Bible, will be presented to the two best Biblical scholars of the Senior Class at the end of their College course.

**THE LYMAN H. ATWATER PRIZE IN POLITICAL SCIENCE.**

This Prize, being the annual interest on the sum of \$1,000, contributed by the Class of 1883, was instituted as a memorial of Rev. Lyman H. Atwater, D.D., LL.D., Professor of Political Science. It will be given to that member of the Senior Class who shall be adjudged by the Professors of Political and Social Science, to have passed the best examination and written the best essay. The subject for the examination in 1886 will be, *The Control of Cities by the State.* The subject for the essay will be, *The Desirable Limitations of Suffrage in Great Cities.* The essay must be ready June 1, 1886; the date of the examination will be announced at that time.

**THE WOOD SCHOLARSHIP.**

The sum of \$150, the income of a legacy of Dr. George B. Wood, will be awarded to that member of the Junior Class who shall stand highest for the Junior year.

**JUNIOR ORATOR MEDALS.**

Four gold medals, or books of equal value, will be awarded by a committee appointed by the Board of Trustees, to the four successful competitors in an Oratorical Contest on the Monday evening before Commencement. The competition will be among eight members of the Junior Class—four from the Clio-sophic and four from the American Whig Societies—selected by committees appointed by the Societies respectively, from their own members in the Faculty.

**THE MACLEAN PRIZE.**

The Maclean Prize, founded by the will of the late Henry A. Stinnecke, consisting of the sum of \$100, will be given to that one of the Orators chosen by the Literary Societies from the Junior Class, who shall on the Monday evening before Commencement pronounce the best English Oration.

The Committee of Judges will be composed of the Professor of Rhetoric and two graduates of the College appointed by the Board of Trustees.

**DICKINSON PRIZE.**

The Dickinson Prize, founded by John Dickinson, Esq., of New Jersey, in 1782, consisting of a medal of the value of \$60 (or its equivalent in money), will be awarded to that member of the Junior Class who shall write the best dissertation upon *The Methods of Discovering Truth in the Various Sciences*. The dissertation to be presented on or before October 15, 1886.

**THE STINNECKE SCHOLARSHIP.**

The Stinnecke Foundation was established in 1870 by the will of the late Henry A. Stinnecke, of the Class of 1860, and was supplemented by a bequest received in 1876 from his aunt, Miss



**Maria Stinnecke.** The income is divided between the Stinnecke Scholarship of \$500, and the Maclean Prize of \$100.

The Stinnecke Scholarship, of the annual value of \$500, tenable during the College course, unless forfeited by neglect of study, "will be given to that person who, having entered the Sophomore Class, shall pass the best examination at the opening of the session in September, 1887, in the Odes of Horace, the Eclogues of Virgil, and the Latin Grammar and Prosody, as well as the Anabasis or Cyropædia of Xenophon and the Greek Grammar." Students of the College who have been members of the Freshman Class, as well as new students entering the Sophomore Class, will be admitted to such examination. The committee of examiners is appointed by the Trustees.

#### THE CLASS OF 1861 PRIZE.

The interest of \$1,200, given by the Class of 1861, will be awarded to that member of the Sophomore Class who shall pass the best examination in June next on those portions of the Mathematical course of the Sophomore year which shall be especially designated by the Professor of Mathematics.

#### THE FRESHMAN FIRST HONOR PRIZE.

A prize of \$200, part of the income of the J. S. K. Fund, to be paid in quarterly installments during the following year, will be awarded to that member of the Freshman Class, who having entered said class at the beginning of the College year, shall, at the end of such year, be reported to the Trustees by the Faculty as having attained the "highest average grade" in Scholarship, provided he pursue his studies in this College, and maintain a good standing during the Sophomore year. No student who has been suspended from College, or who has been put upon his last probation, shall be eligible to this Prize.

**N. B.**—The funds for prizes are gifts of private individuals and do not form part of the general funds of the College. If for any reason there be default in the interest on the securities in which these funds may be invested, the College does not assume responsibility for the payment of the prizes.

## SOCIETIES.

### LITERARY SOCIETIES.

The Cliosophic and American Whig Societies originated early in the history of the College. They are conducted by the undergraduates, but also include in their organization graduates and officers of the College. Both possess halls containing the rooms for meeting, reading rooms and valuable libraries of over 8,000 volumes each. They both pursue courses of literary exercises, award numerous prizes for orations, essays and debates and grant diplomas to their respective graduates.

A generous competition for College honors has always prevailed between them. On the evening before Commencement representatives of the Societies from the Senior Class engage in a public debate—on the preceding evening representatives from the Junior Class engage in a competition in oratory. The details respecting the Lynde Debate and the Junior Orations will be found on pp. 136, 138.

These Societies are considered a part of the educational appliances of the College, and students are advised to join them.

### THE ENGINEERING SOCIETY.

This is an organization conducted by the undergraduates of the Engineering Course, although its membership includes students in other departments of the College, and graduates.

Meetings are held weekly in the Reading Room of the Society in University Hall, and the exercises are of a literary, scientific and technical character.

### THE PHILADELPHIAN SOCIETY.

This is a Society composed of undergraduates, united by a covenant of mutual religious faith and sympathy. It was founded in the year 1825, and has always been an active and successful agency in promoting the religious life of the College. Devotional meetings are held on Thursday and Saturday evenings, under its direction, usually conducted by members of the Faculty. Murray Hall, the building belonging to the Society, was erected

from a bequest left for the purpose by Hamilton Murray of the Class of 1872. It contains, besides the room for worship, a reading room supplied with religious books and periodicals.

#### THE ST. PAUL'S SOCIETY.

The St. Paul's Society is an association similar in nature and aim to the Philadelphian, and is intended to be helpful, devotionally and practically, to those students in the College who have been accustomed to the worship of the Protestant Episcopal Church. It has weekly meetings, conducted by the students, and ordinarily a course of sermons is delivered annually in Trinity Church, under its auspices.

#### BUILDINGS.

The buildings centre around NASSAU HALL, which dates back nearly to the foundation of the College, having been erected in 1756. One wing of this building is still occupied by students. The central and eastern portions contain the Geological Museum and Lecture room. The School of Science building, the Chancellor Green Library, Dickinson Hall, Murray Hall and several of the dormitories have been erected within the last twelve years. The Marquand Chapel, the gift of H. G. Marquand, Esq., of New York, was built in 1882. The Academic lectures and recitations are conducted mainly in Dickinson Hall, while the scientific lecture-rooms and laboratories are principally in the building of the John C. Green School of Science. The students—except by special permission of the Faculty—reside in the College dormitories—the west wing of Nassau Hall, East College, West College, Reunion Hall, Witherspoon Hall, Edwards Hall and University Hall.

#### THE CHANCELLOR GREEN LIBRARY.

The College Library began with the College itself, in a bequest of books by Governor Belcher. The first catalogue, printed in 1760, shows that it then consisted of more than twelve hundred volumes. It suffered much during the revolutionary war, and it was burnt, with Nassau Hall, in 1802. The gifts of

many liberal friends soon reëstablished it, and it slowly advanced to 9313 volumes in 1854. The want of resources for its increase kept it small, until the Elizabeth fund of \$50,000 was created by Mr. John C. Green in 1868. When the present library building was erected by him, in 1872-73, the collection contained about 25,000 volumes. Since that time its progress has been rapid, and it now consists of more than 60,000 volumes. The liberality of those who represent his estate has permitted an average yearly increase of 5000 volumes.

The library is probably strongest in the departments of Mathematical, Physical, and Natural and Mental Science, but it is rich, also, in Philology and Literature. Few libraries surpass it in respect to works on the origin and early history of our language and our race. Generous efforts have been made to enrich it with the serial issues of scientific associations abroad. A collection of books on fine art, soon to be largely increased, may be seen in a separate room. The income of the Library Fund is appropriated to the departments by a Committee of the Faculty—to be expended under the direction of the Professors of the respective departments.

The arrangements of books upon the shelves is by topics, and a pamphlet elucidating this arrangement is kept on every table and given on application to every student. The subject-catalogue of 984 pages is now completed. A manuscript appendix, constantly increasing, is accessible on application at the desk. A large collection of books of reference is kept constantly on the shelves, consisting of twenty encyclopedias, seventy periodicals and the dictionaries of twenty languages.

At the west end of the building is a reading room for the Faculty, furnished with more than fifty periodicals of high character. Students are admitted on application at the desk, and they may borrow the past issues of each periodical when a new number has reached the table.

#### *Library Hours.*

The Library is open every secular day : for the delivery and exchange of books from 10 A. M. to 1 P. M., and from 2 to 4 P. M.; for the consultation of books from 10 A. M. to 1 P. M., and from

2 to 5 P. M. The use of books is allowed, under the rules, to all the students. Resident graduates have the same privileges in the Library as undergraduates.

## MUSEUMS.

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### The E. M. Museum of Geology and Archæology.

This Museum, occupying the central and eastern wings of Nassau Hall, contains collections which are distributed in the three general departments of Geology (including Mineralogy), Palæontology and Archæology. Their arrangement is especially adapted to the purposes of comparative study.

In the GEOLOGICAL DEPARTMENT a special Room contains a unique collection of over 5,000 specimens of erratic boulders and drift materials from Switzerland. There is also a special room devoted to the typical rocks and fossils of the State of New Jersey. A collection of the typical rocks of the State of New York represents the series as described in the Geological Survey of that State.

There is in this department a large collection of minerals, containing about 2,600 specimens, left the College by the late Archibald MacMartin, of New York. The perfection of the specimens, and the number of localities represented in each family, make this collection one of especial value.

The collections of the PALÆONTOLOGICAL DEPARTMENT fill two large halls, with extensive galleries. The central hall, or Synoptic Room, is especially designed and arranged with reference to the general course in Geology. There are mounted casts of the gigantic reptiles and mammals of the secondary, tertiary and quaternary ages. Around these the characteristic fossils of each of the great ages of life form as many groups, which follow each other in chronological order, while within each group the fossils are arranged according to their zoölogical affinities. The typical fossils selected agree, as far as possible, with those mentioned in Dana's Geology, as characteristic of different geological periods.

The upper or eastern hall contains the main collections for advanced students; on the platform are the skeletons of a Masto-

don, an Irish Elk, a Cave Bear, and some of the extinct birds of New Zealand ; also the skulls of *Uintatherium* and *Loxolophodon*. Surrounding the room is a very perfect collection of vertebrate and invertebrate fossils from Europe and America, illustrating the vertebrate and invertebrate forms of all the geological epochs. Included in this series are the fine Eocene and Miocene fossils, procured in the West by the various Princeton collecting parties. There is also a series of fossil insects and plants from Colorado. Altogether the number of fossils, not counting duplicates, is 9,000.

**ARCHÆOLOGICAL DEPARTMENT.**—Here are relics of the Swiss Lake Dwellings, and numerous implements of stone and bronze from Denmark ; also several hundred flint instruments from most of the classical localities of the palæolithic and neolithic ages of France.

America is represented, in the pottery and human remains of the mound builders, by several hundred specimens of Mexican and Peruvian Pottery, and by a number of recent Indian relics. The interesting ethnological collection of objects, chiefly from Alaska and New Mexico, which Dr. Sheldon Jackson presented to the Theological Seminary of Princeton, has been transferred to this Museum by the Trustees of that institution, with the consent of the donor. The Archæological Gallery contains also a series of models of the Cliff-ruins of the Southwest executed under the direction of Dr. Hayden.

Below the eastern hall are the lecture and working rooms.

### **Zoölogical Museum.**

The collections forming this Museum have been chiefly made from the endowment fund of the John C. Green School of Science. There have also been many smaller donations to the Museum from time to time. The collections are placed in the large upper hall of the School of Science building, and are at present especially rich in osteological specimens. On the same floor are the Laboratory and working rooms of the Curator of the Museum. The collection of vertebrates includes a large number of mounted and disarticulated skeletons of the mammals, reptiles, birds and fishes ; also a carefully mounted stuffed

series of the birds of New Jersey, and of other districts of North America, besides alcoholic specimens. A feature of the Ornithological collection is the very large number of unmounted bird skins, arranged for the purposes of comparative study of the plumage, beak and feet. Among the invertebrates are a series of Ascidians, Echinoderms, Molluscs, Crustaceans, Insects, Worms, Corals, Sponges, and microscopic preparations of small forms. A number of mounted and disarticulated skeletons have recently been added to the Osteological collection, and a valuable collection of American Land-shells has been presented by John H. Janeway, Surgeon U. S. A. The whole collection has also been catalogued and numbered. Students can apply to the Assistant Curator for access to the catalogue and cases containing the skeletons.

### **Herbarium and Botanical Laboratory.**

This is on the second floor of the School of Science building, and is arranged as a Museum of the botanical collections, also as a working laboratory for students. The plants are classified according to Bentham and Hooker's *Genera Plantarum*, and include specimens from the different sections of the United States, and from Europe and Australia. There are extra specimens for laboratory use, and dissecting and compound microscopes, anatomical instruments, section cutters, models, diagrams and books of reference.

The Biological collections have been recently increased by specimens of deep-sea animals collected by Professor Libbey; and the Parker collection of New Jersey plants has been supplemented by additional rare specimens presented by Dr. N. L. Britton, of Columbia College.

## **LABORATORIES AND APPARATUS.**

### **Physical Laboratory and Apparatus.**

The Physical Laboratory is fitted up with tables and other arrangements to accommodate about twenty students at once.

Besides the appliances usually employed in lecture demonstrations, the cabinet of apparatus contains all the instruments of precision required in the experimental courses.

The following deserve especial mention :—A fine balance by Becker, sensitive to one milligramme under a load of twenty kilogrammes. A Kathetometer (Grunow), with scale of one metre. A dividing engine and comparator (Rogers). A cylinder Chronograph, for all time observations in the laboratory, in electrical communication with the standard clock of the astronomical observatory. A diapason Chronograph (Koenig), for minute intervals of time. Pendulum apparatus, of both Borda's and Kater's forms. A Spectrometer (Fauth) with 18 inch circle reading by microscope to single seconds. Ditto (Grunow), with smaller circle, reading to 10''. Ditto (Stackpole), reading to 30''. A number of diffraction gratings (Rutherford and Rowland), ruled upon glass and speculum metal; to be used with these spectrometers. A large spectroscope, with dispersive power of twelve prisms (Browning). Sir William Thomson's absolute electrometer and quadrant electrometer (White). Lippmann's capillary electrometer. A set of accurate resistance coils, and standard condenser (Elliot). A large number of galvanometers suited to the different requirements of the laboratory. Sets of standard thermometers; apparatus for calorimetric inquiries; photometers, etc.

### Chemical Laboratories.

The laboratory and cabinets of the department of General Chemistry are fully equipped for the illustration of the courses in the two branches of General and Applied Chemistry.

There is a large laboratory for the department of Analytical Chemistry, and connected with this are the Assistants' rooms, acid room, weighing room and store room, provided with the best appliances. There is also an Assay Laboratory, with crucible and muffle furnaces. These laboratories are all in the School of Science building, and each student has a desk for his own use, with cupboards and drawers in which he can lock up such apparatus as is supplied to him individually.



### **Mineralogical Laboratory and Collection of the School of Science.**

The laboratory contains desks for twenty-six students, with room for fourteen more desks. Each desk is fitted with gas connections for blowpipe work in Determinative Mineralogy, and contains a locked drawer for the student's apparatus.

There are three cabinets of minerals. The principal one contains over five thousand specimens, embracing nearly every mineral species. Two smaller cabinets, one with labeled and the other with unlabeled minerals, are provided for practice with the classes, and to these two cabinets the students have free access.

There is also a collection of 240 specimens of typical rocks; together with a large number of Fuess' rock sections; as well as sections from other sources, for the study of Lithology.

The laboratory is provided also with section cutters, grinding lathes, and other appliances for the special study of minerals and rocks; including a complete Groth's polarizing apparatus with goniometer, a large Babinet goniometer, Norremberg's polarizing apparatus, Rosenbusch's microscope, and minor apparatus.

An interesting collection of coals from Colorado was presented to the mineralogical cabinet by Mr. W. H. Underwood.

### **Histological Laboratory.**

This laboratory is situated on the upper floor of the west wing of Nassau Hall. It is fitted to accommodate twenty-two students at a time, each of whom is provided with the requisite instruments, reagents and staining fluids for the study of the various tissues. The microscopes have been selected with a view to convenience in practical work. A large private collection of slides, illustrating the general subject of Histology, is also placed at the disposal of the student, as well as books of reference and American and foreign publications. The laboratory is open at all hours to its regular students.

### **Morphological Laboratory.**

This laboratory adjoins the School of Science building. It is designed for the practical study of Vertebrate Anatomy, with abundant facilities for dissection and experimental work. Besides the ordinary apparatus, there is a chick incubator for Embryological study, and an aquarium containing live Amphibia belonging to the different groups. For comparative study there belongs to the laboratory a collection of disarticulated skeletons of the typical vertebrates, and a number of alcoholic specimens. The laboratory library contains the principal works of reference. There is a fee of \$8 for ordinary courses in dissection. The laboratory is open during the day and evening.

## **ASTRONOMICAL OBSERVATORIES.**

### **The Halstead Observatory.**

This is appropriated to scientific work, chiefly in the department of Astronomical Physics. The building is of stone, with an iron dome, 39 feet in diameter. The power for moving the dome and its sliding shutter is furnished by a gas engine. The principal instrument is the great equatorial of 23 inches aperture and 30 feet focal length, made by the Clarks of Cambridge. It is provided with all the usual micrometers, spectroscopes and other accessories on a scale proportional to the instrument. The building contains also two clocks and a chronograph. An Edison dynamo-electric machine supplies the electric currents required in spectroscopic investigation.

### **The Observatory of Instruction.**

This establishment is devoted entirely to the use of students, and is fully equipped for its purpose. It possesses an equatorial (by Clark) of  $9\frac{1}{2}$  inches aperture, with an unusual complement of spectroscopic and other accessories. It has also a 9-inch reflector; a meridian circle with telescope 4 inches in diameter; two transit instruments with 3-inch telescopes, both of them

arranged for use as zenith-telescopes; a 3-inch prime-vertical instrument; a chronograph; two standard clocks, and two chronometers. There are also a number of sextants, and all the other subsidiary apparatus required for carrying out the work detailed on page 67.

### GYMNASIUM.

The Gymnasium was built in 1869 by Mr. Robert Bonner and Mr. Henry G. Marquand. It is thoroughly equipped with all the apparatus necessary for a complete physical training. It has hot and cold shower and plunge baths, dressing rooms, bowling alleys, and besides the main hall, a room for base ball practice. There is also a gallery for visitors. The Gymnasium is open from 7 to 8 A. M., 12 M. to 1.30 P. M., 5 to 6.30 P. M., on every day except Saturday, when it is open from 12 M. to 6.30 P. M. During the second term exercise in the gymnasium is required of all members of the Sophomore and Freshman classes, three times a week; the remainder of the year attendance is optional. Classes in the use of Indian Clubs and Calisthenics are held every day during the noon and afternoon hours. These exercises are adapted to all grades of strength, and are such as to maintain and improve in health all who take part in them, health being the primary and strength the secondary object of exercise. Special exercise on the various apparatus is under the personal supervision of the Superintendent, who is also at the command of any student for advice in regard to physical development and the laws of health. During the fall term there is an outdoor athletic meeting for prizes; in the spring term a gymnastic contest also for prizes, and at Commencement a gymnastic exhibition.

## GENERAL COLLEGE ORDERS.

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### TERMS AND VACATIONS.

The year is divided into two terms of fourteen weeks each and one of nine weeks.

The *first* term of the *present* College year (1885-6) began on Wednesday, the 16th of September, 1885, and ends on Wednesday, the 23rd of December. The *second* term begins on Wednesday, the 6th of January, 1886, and ends on Wednesday, the 14th of April. The *third* term begins on Wednesday, the 21st of April, and ends on Wednesday, the 23rd of June, 1886,—the day of the Annual Commencement.

Students are required to return to College on the first day of each term, and absences from any College exercise at the beginning of a term count double.

Students are not allowed to leave College during term-time without express permission obtained from the Faculty or from the officer of the class to which they belong.

### COMMENCEMENT ANNIVERSARIES.

THE ANNUAL COMMENCEMENT takes place on the Wednesday preceding the last Wednesday in June.

THE BACCALAUREATE SERMON of the President to the graduating Class is delivered before the College on the Sunday preceding Commencement.

On the subsequent days preceding Commencement will be held the Class Day Exercises of the graduating Class, the Lynde Prize Debate, the Junior Oratorical Contest, the Reading of Theses by the graduating Class of the School of Science, the Annual Meetings of the Literary Societies, and the Annual Meeting of the Alumni Association of Nassau Hall.

**PUBLIC WORSHIP.**

Prayers are offered in the Marquand Chapel every week-day morning. In these services, members of the Faculty officiate in turn.

Divine service, under the superintendence of the President, is held in the Marquand Chapel, on Sunday, at 11 o'clock A. M. The pulpit is filled alternately by Professor Murray and the clerical members of the Faculty.

Religious services are held in the chapel every Sabbath afternoon at 5 o'clock.

Permission to attend divine service elsewhere than in the College, on special occasions, is granted on application to the President. For permission to attend regularly one of the Churches of the town on Sabbath morning, a written request from the parent or guardian of the applicant must be presented to the President.

**RELIGIOUS INSTRUCTION.**

Biblical Instruction is given during the week, as follows :

To the Senior Class by Dr. Murray : The Development of Doctrine in the New Testament.

To the Junior Class by Professor Ormond : The Book of Acts.

To the Sophomore Academic Class by Professor Orris : St. John's Gospel in the Greek. Professor Winans : St. Luke's Gospel.

To the Freshman Academic Class by Professors Hunt and West : General Introduction to the study of the Scriptures. The Poetical Books of the Old Testament and Parables of our Lord.

To the Freshman and Sophomore Classes in the School of Science by Professor Macloskie : Typology of the Old Testament and the Life of Christ.

**ATTENDANCE UPON COLLEGE EXERCISES.**

The several Classes ordinarily attend three Recitations or Lectures every day, except Saturday, when there are but two College exercises.

Every undergraduate student is required to attend all College exercises in the Chapel, to be present during the lectures and recitations of his Class, and is expected to avail himself of the privileges of the Library and Gymnasium upon the conditions and at the hours appointed.

Each student is allowed a certain limited number of absences from chapel and recitations during the term. When a student's absences exceed this gratuity they are charged against his gratuity for the next term, or otherwise dealt with by such discipline as the Faculty may direct.

### CHARITABLE FUNDS.

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The RICHARDS Fund. A bequest of Mrs. Esther Richards of New York, amounting to \$2,970.82, for the benefit of candidates for the ministry. Received in 1790.

The LESLIE Fund. A bequest of James Leslie of New York, a graduate of the class of 1759, amounting to \$10,677.49, for "the education of poor and pious youth with a view to the ministry of the Gospel in the Presbyterian Church." Received in 1792.

The HODGE fund. A bequest of Hugh Hodge of Philadelphia, of a house and lot on Market St. above Second (No. 205), "to be held by the Trustees in trust, to lease out from time to time and the rents to be applied to the support and education of pious youth for the ministry." Received in 1805. The net income for the current year will amount to about \$750.

The VAN ARSDALE Fund. A bequest of Robert Van Arsdale of Newark, N. J., of the Class of 1826, amounting to \$3,000, "in trust for promoting charitable instruction in the College of New Jersey, according to the discretion of the Faculty." Received in 1875.

ENDOWED SCHOLARSHIPS.

1-3.	The COLT Scholarships, founded by Roswell Colt, of Paterson, N. J.,	\$3000.
4.	The NEWKIRK Scholarship, founded by Matthew Newkirk, of Philadelphia,	1000.
5.	The JOHN JOSEPH RANKIN Memorial Scholarship, founded by his father Wm. Rankin, of Newark, N. J.,	1000.
6.	The CRESSWELL Scholarship, founded by A. Cresswell, of Kishicoquillas, Pa.,	1000.
7.	The ISAAC R. RANKIN Scholarship, founded by Isaac R. Rankin, of Newark, N. J.,	1000.
8.	The MUSGRAVE Scholarship, founded by Rev. George W. Musgrave. D. D.,	1000.
9.	The COGSWELL Scholarship, founded by Rev. Jonathan Cogswell, D. D.,	1000.
10.	The GREEN Scholarship, founded by Hon. Henry W. Green, LL.D.,	1000.
11-15.	The LENOX Scholarships, founded by James Lenox, of New York,	5000.
16.	The HODGE Scholarship, founded by Dr. Hugh L. Hodge, of Philadelphia,	1000.
17.	The A. B. BAYLISS Scholarship, founded by A. B. Bayliss, of Brooklyn,	1000.
18.	The HENRY J. VAN DYKE Scholarship, founded by George L. Sampson, of Brooklyn,	1000.
19.	The GREGORY Scholarship, founded by Dudley S. Gregory, of Jersey City,	1000.
20.	The FIRST PRESBYTERIAN CHURCH OF PEEKSKILL Scholarship, founded by members of the Church,	1000.
21.	The VAN VORST Scholarship, founded by Hon. John Van Vorst, of Jersey City,	1000.
22.	The JANEWAY Scholarship, founded by the Rev. Jacob J. Janeway, D. D.,	1000.
23.	The PRESBYTERIAN CHURCH OF HUNTINGTON, L. I., Scholarship, founded by the Ladies of the Church,	1000.
24.	The BACKUS Scholarship, founded by E. F. Backus, of Philadelphia,	1000.
25.	The VAN SINDEREN Memorial Scholarship, founded by Mrs. and Miss Van Sinderen, of Brooklyn,	1000.
26.	The NORRIS HALSTEAD Scholarship, founded by Gen. N. Norris Halstead, of Newark, N. J.,	1000.
27.	The MACLEAN Scholarship, founded by Drs. John and George M. Maclean,	1000.
28.	The HAINES Scholarship, founded by Richard T. Haines, of Elizabeth, N. J.,	1000.
29.	The JACKSON Scholarship, founded by the Hon. John P. Jackson, of Newark, N. J.	1000.

80. The TUTTLE Scholarship,  
founded by Joseph N. Tuttle, of Newark, N. J., 1000.
81. The GERTRUDE N. WOODHULL Memorial Scholarship,  
founded by her son Dr. John N. Woodhull, of Princeton, 1000.
82. The NATHANIEL W. TOWNSEND Memorial Scholarship,  
founded by his daughter, Mrs. Daniel Haines, 1000.
83. The FIRST PRESBYTERIAN CHURCH OF BRIDGETON  
Scholarship, founded by members of the Church, 1000.
84. The SKIDMORE Scholarship,  
founded by Joseph P. Skidmore, of New York, 1000.
85. The SPENCER Scholarship,  
founded by L. S. Spencer, 1000.
86. The JEREMIAH D. LALOR Memorial Scholarship,  
founded by a friend, 1000.
87. The MARQUAND Scholarship,  
founded by Frederick Marquand, of Southport, Conn., 1000.
88. The FIRST PRESBYTERIAN CHURCH OF TRENTON  
Scholarship, founded by members of the Church, 1000.
89. The CAMERON Scholarship,  
founded by the Hons. Simon and Donald Cameron, 1000.
40. The SECOND PRESBYTERIAN CHURCH OF ELIZABETH  
Scholarship, founded by members of the Church, 1000.
41. The C. S. BAYLISS Scholarship,  
founded by Charles S. Bayliss, of Brooklyn, 1000.
42. The ELIZA MUSGRAVE GIGER Memorial Scholarship,  
founded by her son Prof. George M. Giger, D. D., 1000.
43. The BLAIR Scholarship,  
founded by James Blair, of Scranton, Pa., 1000.
44. The PENNINGTON Scholarship,  
founded by Dr. Samuel H. Pennington, of Newark, N. J., 1000.
45. The FENTON Scholarship,  
founded by Aaron Fenton. 1000.
46. The TRASK Scholarship,  
founded by Alanson Trask, of Brooklyn, 1000.
47. The WITHINGTON Scholarship,  
founded by Chandler Withington, of Kingston, N. J., 1000.
48. The FIRST PRESBYTERIAN CHURCH OF NEWARK  
Scholarship, founded by members of the Church, 1000.
49. The CARTER Scholarship,  
founded by Aaron Carter, of Newark, N. J., 1000.
- 50-54. The HOLMES Scholarships,  
founded by Capt. Silas Holmes, of New York, 5000.
55. The COLWELL Scholarship,  
founded by Stephen Colwell, of Philadelphia, 1000.
56. The AITKEN Scholarship,  
founded by John Aitken, of New York, 1000.
57. The BULLARD Scholarship,  
founded by Mrs. P. Bullard, 1000.



58. The PERRY Scholarship,  
founded by the Hon. Nehemiah Perry, of Newark, N. J., 1000.
59. The HAMILL Memorial Scholarship,  
founded by the Rev. Samuel M. Hamill, D. D., 1000.
60. The CYRENIUS BEERS Memorial Scholarship,  
founded by his daughter, Miss Julia Beers, 1000.
61. The JACOBUS Scholarship,  
founded by Peter Jacobus, of Newark, 1000.
62. The MATTHEW B. HOPE Scholarship,  
founded by the Trustees as an acknowledgment of  
the services of Prof. Hope in raising an endowment  
of over \$100,000, 1000.
63. The JOHN MACLEAN Scholarship,  
founded by a friend of President Maclean, 1000.
64. The WHITE Scholarship,  
founded by William White, Esq., 1000.

About sixty of the above Scholarships were founded between the years 1853 and 1858, mainly through the efforts of President Maclean and Professor Hope.

## PECUNIARY AID.

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The College has for many years remitted, on application, the tuition of candidates for the ministry, of the sons of ministers, and also of other applicants who present satisfactory testimonials of good moral character and of more than ordinary intellectual ability, with the assurance that the aid requested is absolutely needed. No candidate for admission to College who is unexceptionable morally and intellectually will be refused admission because of inability to pay the charge for tuition.

In consequence of this liberal policy the amount of tuition remitted has increased until it is now more than double the entire income from the Scholarship and Charitable Funds. If this policy is to be continued a large increase of these funds is urgently demanded. The Trustees, accordingly, at their meeting in June, 1885, appointed a Joint-Committee of members of the Board of Trustees and of the Faculty, to raise, if possible, for the object indicated, \$100,000. This effort is commended to the attention and favor of the Alumni and other friends of the College.

Although the charge for tuition, since the first Scholarships were founded has been advanced from \$60 to \$100, Scholarships for the benefit of candidates for the ministry, sons of ministers, or other students needing assistance, may be founded by the payment of \$1,000.—the Scholarship to be designated as the donor may direct.

Applications for Scholarships, or for aid from the Charitable Funds, should be made to Professor Duffield.

### EXPENSES.

The following is the Schedule of the College expenses for 1885-6.

Board, 37 weeks.....	\$ 2.75 to \$7 per week.
Washing, 37 weeks.....	50 cents per week.
Tuition, Academic.....	100.00 per annum.
Tuition, School of Science.....	120.00 per annum.
*Tuition, Special Course in Analytical Chemistry..	120.00 per annum.
Tuition, extra for Laboratory Chemistry, Senior Elective.....	18.00 per annum.
Room Rent (according to location of rooms).....	18.00 to \$200 per annum.
Fuel Deposit (according to location of rooms).....	17.00 to \$26 per annum.
Gas Deposit (according to location of rooms).....	24.00 to \$42 per annum.
Servants and Public Rooms (Library, Gymnasium, Museums, &c.).....	40.00 per annum.
Matriculation Fee, payable on entrance.....	5.00
Graduation Fee, payable third term, Senior year...	12.00

The charges for fuel and gas are approximations based upon the greatest amount used. An account of the actual consumption is kept with each room, and the exact charge is adjusted at the end of the year. The charge for fuel includes the cost of kindling, and the labor of carrying coal, making fires, &c.

*Apparatus Deposits.*—Students pursuing certain courses in the School of Science are required to make deposits to pay for apparatus injured or destroyed. At the end of the term any excess in favor of the student is placed to his credit on the bill for next session. The deposits in the courses for B. S. are :—Sophomores, first term, \$12; second term, \$10; third term, \$5. Juniors taking any work in Chemical Analysis, second term, \$12;

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\*For other Special Courses arrangement will be made upon consultation with the Professor in charge.

third term, \$8. Seniors electing the course in Chemistry and Mineralogy, first term, \$20; second term, \$15; other Seniors taking any work in Chemical Analysis, first term, \$15. The deposits in the course for C. E., all payable in the first term, are:—Freshmen, \$3; Juniors, \$6; Seniors, \$4; all of the foregoing being for apparatus in the Engineering Department; also, Sophomores, \$5 for the Engineering Department, and \$12 for Blowpipe apparatus. Academic Seniors, electing Laboratory Chemistry, will deposit \$7, payable in the first term.

### ESTIMATES OF ANNUAL EXPENSES.

Attention is specially called to the following approximate estimate of the necessary annual expenses for a student occupying a room in College, without including clothes, traveling or vacation expenses:

	<i>Min.</i>	<i>Medium.</i>	<i>Max.</i>
Board, 38 weeks at \$2.75 to \$7.00.....	\$104	\$152	\$266
Washing, 38 weeks at 50c. per week.....	19	19	19
Tuition and Fees.....	140	140	140
Room Rent.....	25	60	200
Fuel and Light (Kerosene or Gas).....	15	25	50
Books.....	15	20	25
Hall Dues and College Subscriptions.....	7	25	50
	<hr/> \$325	<hr/> \$441	<hr/> \$750
Deduct for Students on Scholarship.....	100		
	<hr/> \$225		
Deduct for Candidates for Ministry.....	30		
See page 155.	<hr/> \$195		

### College Bills.

All College expenses, including board and washing, must be paid in advance to the Treasurer of the College.

Students are required to call at the Treasurer's office in the course of the first ten days of each session, and to give information as to their place of boarding, etc., so that their bills can be made out. All bills must be paid within the first four weeks of the session. Failure to comply with this rule shall deprive the student of the privileges of the College until payment is made, unless excused by special vote of the Faculty.

When a student enters college before the middle of a session, he shall pay in full the usual college charges for that session, with the exception of the charges for board and washing; if he enter after the middle of the session, he shall pay one-half. For board and washing he shall pay in proportion to the time.

When a student leaves the college, whether voluntarily or by dismissal, before the middle of any session, one-half of the charges for tuition and public rooms for that session shall be refunded. But in the case of temporary absence and subsequent return, although the absence be for more than half a session, no such rebate shall be granted.

When a student is dismissed from college for any cause, the advance deposit for board, washing, fuel and gas, beyond the time of his dismissal shall be refunded to his parent or guardian.

When at the end of the first or second sessions the amount of the advance deposit proves to be in excess of the sum required to defray the board, washing, or room bills of any student, the excess shall be credited on his bill for the next session. At the end of the college year the amounts overpaid for board, washing, room-rent, fuel, or gas shall be refunded by the treasurer to the student's parent or guardian.

#### **RULES RESPECTING RENTAL AND ALLOTMENT OF ROOMS.**

1. Whenever a student desires to occupy a room in one of the College buildings, he and his parent or guardian shall be required to sign a room agreement, engaging to pay the rent and charges of said room for the ensuing Academic year, or for the remainder of the current year, as the case may be.

2. The tenure of all rooms so engaged shall be subject to the following conditions as regards damages and repairs, viz. : (1.) All damage done to a room beyond the ordinary wear and tear, shall be made good as soon as possible at the expense of the occupant. This provision includes the breakage of glass whether by accident or design. The occupant shall employ the proper college workmen and pay the cost of the repairs at once to the Treasurer. (2.) The occupants of a room shall deposit

with the Curator the sum of twenty-five cents for every key furnished, which amount shall be refunded on return of the keys.

3. Students now occupying rooms, or to whom rooms shall hereafter be allotted, may have the option of retaining such rooms until the end of their College course, on condition of annually notifying the Treasurer, of their intention of retaining their room for the following year, and signing a new room-agreement before May 15th ; otherwise their rooms will be considered as vacated, and will be included in the annual allotment.

4. Rooms becoming vacant at or near the close of the College year shall be assigned to new occupants, by lot. The members of the Junior and Sophomore Classes who desire a choice shall draw lots first ; then, the Freshmen. As soon as the drawing is completed the rooms must at once be selected in order of priority of choice.

5. No student will be entitled to the room allotted him unless the room agreements shall have been signed and returned to the Treasurer before June 5th.

6. New students shall have the choice of any remaining rooms in the order of their application, after admission into College, on condition of immediately signing the room agreement, and depositing with the Treasurer the rent for the next ensuing term.

7. Every student who draws or retains a room is expected to occupy the same, and pay the rent and charges, or his share thereof, until the end of the College year, unless sooner released by the proper authority.

8. A student who expects to be absent on leave for a term may be released from the above obligation, by notifying the Treasurer before the beginning of the term, and by giving up the room ; but no abatement or drawback for room rent will be made to any student vacating his room during a term, unless by express direction of the Faculty.

9. Whenever, by any contingency, one of two room-mates is permitted or obliged to cancel his room agreement, the remaining occupant must vacate the room at the end of the cur-

rent term, unless he agrees to pay the whole rent, or provides a room-mate who shall join him in signing a new agreement for the remainder of the College year. When one of two occupants of a room is a member of the Senior Class, the room shall become vacant when the Senior graduates, and be subject to the provisions of Rule 4 ; except in cases where the joint occupancy has continued for at least one year.

10. When rooms are vacated during the first or second term the rent shall be paid to the end of the term (see Rule 8), at which time the students who may have registered their names as applicants for vacancies, shall draw for them by lot.

11. Exchange of rooms, or substitution of one occupant for another, must be by authority of the Treasurer, and any student moving into a room, without authority *previously obtained*, will be liable to a fine of \$10, and be required to vacate the room. Such exchanges can only be made at the end of a term, or in the course of the first three days of the following term.

12. No tenant of a College room who is permitted or compelled to vacate such room will be allowed to transfer directly or indirectly any interest in or title to the room.

13. When a student vacates a room he shall immediately remove the furniture therefrom ; unless the student to whom the room is assigned elects to purchase the same. In case a sale is agreed upon between the parties, the price to be paid by the purchaser shall be ascertained by deducting from the cost price of the furniture a discount of twenty per cent. per annum for the time the same has been in use by the vendor ; provided that the price to be paid for the furniture in a room shall in no case exceed \$200. All sales shall be approved by the Treasurer before the same are finally consummated.

14. Students leaving College, or otherwise vacating their rooms, shall be allowed to store their furniture in a room assigned by the College authorities, under the charge of a salesman appointed by the College, where it may be offered for sale. Furniture remaining unsold at the end of three months, if not removed by the owner, will be disposed of at public auction to the highest bidder.













PROSPECT AVE.

WASHINGTON ST.

# COLLEGE BUILDINGS.

*Erected.*

1. Nassau Hall, . . . 1756
2. Dean's House, . . . 1756
3. College Offices, . . . 1808
4. East College, . . . 1833
5. West College, . . . 1836
6. Olio Hall, . . . 1838
7. Whig Hall, . . . 1838
8. Old Chapel, . . . 1847
9. President's House, 1849
10. Halsted Observat'y, 1869
11. Gymnasium, . . . 1869
12. Reunion Hall, . . . 1870
13. Dickinson Hall, . . . 1870
14. Library, . . . 1873
15. School of Science, 1873
16. University Hall, . . 1876
17. Witherspoon Hall, 1877
18. Work'g Observat'y, 1878
19. Murray Hall, . . . 1879
20. Edwards Hall, . . . 1880
21. Marquand Chapel, 1881
22. Morphological Labor'y
23. First Presbyt'n Church
24. R. R. Station.



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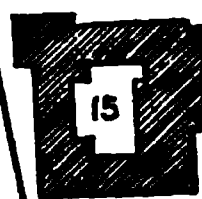
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CATALOGUE  
OF THE  
COLLEGE OF NEW JERSEY  
PRINCETON

ONE HUNDRED AND FORTIETH YEAR,

1886-87.

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The Princeton Press.





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## CALENDAR.

### 1886.

- Sept. 14-15.* Examinations for admission, in Princeton only.  
*Sept. 15.* First term begins—College assembles at 8 P. M.  
in Marquand Chapel.  
*Sept. 16.* Conditioned and unexamined students assemble  
in the Old Chapel at 10 A. M.  
*Nov. 11.* Stated Meeting of the Board of Trustees.  
*Nov. 24-29.* Thanksgiving recess.  
*Dec. 13-22.* Examinations. End of first term.  
*Dec. 22-Jan. 5.* Christmas vacation.

### 1887.

- Jan. 5.* Second Term begins.  
*Jan. 27.* Day of Prayer for Colleges.  
*Feb. 10.* Stated Meeting of Board of Trustees.  
*Feb. 22.* Washington's Birthday—Exercises in Univer-  
sity Hall.  
*April 13.* End of second term.  
*April 13-20.* Spring vacation.  
*April 20.* Third term begins.  
*May 14.* Last day for renewing room agreements for '87-8.  
*May 25-June 4.* Senior final examinations.  
*June 4.* Annual allotment of rooms.  
*June 8-18.* Examinations of the three lower classes.  
*June 19.* Baccalaureate sermon.  
*June 20.* Class Day—Junior Orations, 7.30 P. M.  
*June 21.* Reading of Theses by Scientific students—An-  
nual Meetings of Literary Societies and Alumni  
Association—Lynde Prize Debate, 7.30 P. M.  
*June 22.* 140th Annual Commencement.  
*June 20-22.* Commencement Meeting of Board of Trustees.  
*June 23-24.* Examinations for admission, held simultane-  
ously in Princeton and Western cities.  
*June 24-Sep. 14.* Long vacation.  
*Sept. 13-14.* Examinations for admission, and on entrance  
conditions, in Princeton only.

<i>Sept. 14.</i>	First term begins—College assemblies at 8 P. M. in Marquand Chapel.
<i>Sept. 15.</i>	Conditioned and unexamined students (not candidates for entrance) assemble in the Old Chapel at 10 A. M.
<i>Nov. 10.</i>	Stated Meeting of the Board of Trustees.
<i>Nov. 23-28.</i>	Thanksgiving Recess.
<i>Dec. 12-21.</i>	Examinations. End of first term.
<i>Dec. 21-Jan. 4.</i>	Christmas vacation.

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**\*Deceased Nov. 11, 1886.**

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Treasurer's Assistant.

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Organist.

ISAAC J. TURNER,

Superintendent of Gymnasium.

MATTHEW GOLDIE,

Proctor.

DIRECTORY.

Members of Faculty and Instructors residing in College Buildings.

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ALBERT P. CARMAN,	5 W. W. H.
LEROY W. McCAY,	47 U. H.
WILLIAM F. MAGIE,	30 U. H.
HERBERT S. S. SMITH,	4 E. W. H.
JOHN H. WESTCOTT,	8 N. W.

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Secretary.—THE DEAN.
2. *Schedule of Studies*.—Chairman.—THE PRESIDENT.  
Secretary.—PROF. WEST.
3. *Sanitary*.—Chairman.—THE DEAN.  
Secretary.—PROF. SLOANE.
4. *Assignment of Rooms*.—Chairman.—THE DEAN.
5. *College Publications*.—Chairman.—THE DEAN.  
Secretary.—PROF. ORMOND.
6. *Music*.—Chairman.—PROF. DUFFIELD.  
Secretary.—PROF. WEST.
7. *Scholarships and Charitable Funds*.—  
Chairman.—PROF. DUFFIELD.
8. *Teachers and Schools*.—Chairman.—PROF. PACKARD.  
Secretary.—PROF. WINANS.
9. *Out-door Sports*.—Chairman.—PROF. SLOANE.  
Secretary.—PROF. ROCKWOOD.

## CLASS OFFICERS.

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### ACADEMIC.

1. Seniors, PROF. SCHANCK.
2. Juniors, PROF. DUFFIELD.
3. Sophomores, PROF. PACKARD.
4. Freshmen, Div. I. MR. WESTCOTT.  
Div. II. PROF. FINE.  
Div. III. PROF. WEST.  
Div. IV. PROF. WINANS.

### SCIENTIFIC.

1. Seniors, Juniors and Sophomores, B.S., PROF. CORNWALL.
2. Seniors, Juniors and Sophomores, C.E., PROF. McMILLAN.
3. Freshmen, PROF. ROCKWOOD.

**FELLOWS.**  

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- |   | <i>Residence.</i>               |
|---|---------------------------------|
| <b>EDWARD DEMOSS MILLER, A.B., . . . . .</b>  | <b><i>Princeton.</i></b>        |
| Chancellor Green Fellow in Mental Science.    |                                 |
| <b>GEORGE BLACK RODDY, A.B., . . . . .</b>    | <b><i>Princeton.</i></b>        |
| Fellow in Classical Literature.               |                                 |
| <b>TAYLOR REED, A.B., . . . . .</b>           | <b><i>Princeton.</i></b>        |
| Class of 1860 Fellow in Experimental Science. |                                 |
| <b>JAMES HARRINGTON BOYD, A.B., . . . . .</b> | <b><i>Princeton.</i></b>        |
| J. S. K. Fellow in Mathematics.               |                                 |
| <b>HARRY C. ELSING, A.B., . . . . .</b>       | <b><i>Newark.</i></b>           |
| Boudinot Fellow in Modern Languages.          |                                 |
| <b>JOHN CASS MATHIS, A.B., . . . . .</b>      | <b><i>Springfield, Ill.</i></b> |
| Bondinot Fellow in History.                   |                                 |
| <b>JOHN W. PHILLIPS, M.S., . . . . .</b>      | <b><i>Princeton.</i></b>        |
| E. M. Fellow in Biological Science.           |                                 |

## GRADUATE STUDENTS.

Harris Ely Adriance, <sup>8</sup>	Williams,	Poughkeepsie, N. Y.
Samuel Barber, <sup>1</sup>	Lafayette,	Mifflinburg, Pa.
D. E. Bedinger, <sup>2 9</sup>	Central Univ.,	Richwood, Ky.
Alvin Blackwell, <sup>1 2 7</sup>	Princeton,	Pennington, N. J.
James H. Boyd, <sup>1 10 20 21</sup>	Princeton,	Wooster, O.
W. H. Bradley, <sup>1 9</sup>	Westminster,	St. Louis, Mo.
D. C. Brewer, <sup>1 2 9</sup>	Williams,	Boston, Mass.
Putnam Cady, <sup>4</sup>	Princeton,	Princeton, N. J.
Robert E. Caldwell, <sup>1</sup>	Union Theol. Sem.,	Frankfort, Ky.
A. Guyot Cameron, <sup>1 4 6 10</sup>	Princeton,	Princeton, N. J.
J. Cannon, <sup>9</sup>	Randolph Macon,	Salisbury, Md.
W. Y. Chapman, <sup>1</sup>	Mt. Allison,	Botsford, N. B.
Francis J. Cheek, <sup>6</sup>	Centre College,	Danville, Ky.
David S. Clark, <sup>1</sup>	Mt. Union,	Prospect, Pa.
Henry E. Cobb, <sup>8</sup>	Rutgers,	Flushing, L. I.
F. S. Coffin, <sup>2</sup>	Dalhousie,	Mt. Stewart, P. E. I.
George L. Cowen, <sup>1</sup>	Wooster Univ.,	Newville, Pa.
Oliver T. Crane, <sup>9</sup>	Yale,	Mills City, Montana.
George S. Duncan, <sup>1 2 9</sup>	Williams,	Albany, N. Y.
F. G. Ellett, <sup>2</sup>	Princeton,	Layton, N. J.
Robert Graham Evans, <sup>6 12</sup>	Centre College,	Danville, Ky.
H. Fitz-Simmons, <sup>2</sup>	Queen's Coll.,	Belfast, Castledawson, Ireland.
M. C. Fleming, <sup>1</sup>	Princeton,	Xenia, O.
Edward G. Fullerton, <sup>1</sup>	Univ. of Pa.,	Philadelphia.
Hugh L. Furneaux, <sup>1 2</sup>	Dalhousie, St. John's,	Newfoundl'd.
William Gardner, <sup>1</sup>	Amherst,	Hartford, Conn.
James P. Green, <sup>1 7</sup>	Wabash,	Crawfordsville, Ind.
David B. Greigg, <sup>2 7</sup>	Wabash,	Harper, Iowa.

Joseph C. Harvey, <sup>1 2 9</sup>	Lafayette,	Philadelphia
Hugh L. Hodge, <sup>1 9</sup>	Princeton,	Hartford, Conn.
Richard M. Hodge, <sup>1</sup>	Princeton,	Hartford, Conn.
B. D. Holter, <sup>1 6</sup>	Lake Forest,	Syracuse, N. Y.
Samuel V. V. Holmes, <sup>6</sup>	Williams,	Albany, N. Y.
W. B. Hamilton, <sup>1</sup>	Wash. & Jeff.,	Washington, D. C.
Wm. H. Hudnut, <sup>1</sup>	Princeton,	Orange, N. J.
William R. Huston, <sup>6</sup>	Delaware,	New London, Pa.
C. A. Hyland, <sup>1 1</sup>	S. W. P. Univ.,	Yokema, Minn.
Albert E. Jack, <sup>6</sup>	Lake Forest,	Parmington, Ill.
Charles A. Jaggard, <sup>1 6 10 23</sup>	Princeton,	Southampton, L. I.
John Knox, <sup>2</sup>	Lafayette,	Norristown, N. J.
G. I. M. Lopez, <sup>1</sup>	Normal School,	Neuchâtel, Neuchâtel, Spain.
Edward Mack, <sup>6</sup>	Davidson,	Port Mill, S. C.
Jacob E. Mallmann, <sup>1</sup>	—————	Brooklyn, N. Y.
S. J. McClenaghan, <sup>1 6 9</sup>	Princeton,	Kings Bridge, Pa.
S. A. McElroy, <sup>1 2</sup>	Centre,	Louisville, Ky.
E. B. McGilvary, <sup>6</sup>	Davidson,	Chieng Mai, Siam.
J. M. McLeod, <sup>2</sup>	Dalhousie,	Valley Field, P. E. I.
Wm. B. Melvaine, <sup>1</sup>	Davidson,	Dry Creek, S. C.
Edward Demoss Miller, <sup>1 6 5</sup>	Princeton,	Gerrardstown, W. Va.
Marion M. Miller, <sup>10</sup>	Princeton,	Eaton, O.
Wm. Hayes Moore, <sup>1</sup>	Westminster,	Colona, Md.
Minot S. Morgan, <sup>23</sup>	—————	Princeton, N. J.
W. E. Morgan, <sup>6 7</sup>	—————	Utica, N. Y.
Wm. Morrison, <sup>1</sup>	Assembly	Belfast, Irel'd), Letterkenny, Irel'd
D. A. Murray, <sup>2</sup>	Monmouth,	Cedar Rapids, Iowa.
Alfred Nicholson, <sup>1</sup>	Dalhousie,	Charlottetown, P. E. I.
Charles A. Oliver, <sup>6</sup>	Univ. of Pa.,	Germantown, Pa.
George P. Pierwon, <sup>7</sup>	Princeton,	Elizabeth, N. J.
Wm. F. Plummer, <sup>1</sup>	Wash. & Jefferson,	Florence, Pa.
Da Costa Pomerene, <sup>2</sup>	Princeton,	Berlin, O.
Thos. N. Potts, <sup>1</sup>	R. M. College,	Williamsburg, Va.
E. E. Reed, <sup>1</sup>	Parsons,	Fairfield, Iowa.
Taylor Reed, <sup>23 25</sup>	Princeton,	Reedsville, Pa.
George Reynolds, <sup>1</sup>	Princeton,	Orange, N. J.
C. A. Richmond, <sup>6</sup>	Princeton,	East Orange, N. J.

W. H. Robinson, <sup>4</sup>	Princeton,	West Hebron, N. Y.
George B. Roddy, <sup>1 4 5 11</sup>	Princeton,	New Bloomfield, Pa.
E. H. Rowe, <sup>4</sup>	Randolph Macon,	Bowling Green, Va.
Edward H. Rudd, <sup>6 8</sup>	Princeton,	Sag Harbor, L. I.
G. C. Shaw, <sup>2</sup>	Lincoln Univ.,	Lewisburg, S. C.
Donald F. Shepherd, <sup>1</sup>	Davidson,	Hinesville, Ga.
Brevard D. Sinclair, <sup>1</sup>	—————	Asheville, N. C.
Wm. C. Stimson, <sup>1</sup>	Lewisburg,	Ringoes, N. J.
Oliver Smith Strong, <sup>5 10 23 26 28 29</sup>	Princeton,	Montclair, N. J.
George S. Swezey, <sup>1 9</sup>	Rochester,	Batavia, N. Y.
Alfred W. Thompson, <sup>1</sup>	Dalhousie,	Durham, Nova Scotia.
George E. Thompson, <sup>1</sup>	Lake Forest,	South Bend, Ind.
Thomas Thompson, <sup>1 2</sup>	Knox,	Glasgow, Scotland.
Lewis H. Towler, <sup>1 7 9</sup>	Princeton,	Córunna, Mich.
W. W. Tufts, <sup>2</sup>	Dalhousie,	Halifax, N. S.
Lewis C. Wainwright, <sup>1</sup>	W. Maryland,	Princess Anne, Md.
John G. Watson, <sup>1 2 9</sup>	Lafayette,	Scranton, Pa.
Wm. S. Watson, Jr., <sup>9</sup>	Coll. of City N. Y.,	New York.
Ed. S. Wallace, <sup>2</sup>	Wash. & Jefferson,	Allegheny, Pa.
Edward E. Weaver, <sup>1 4 28</sup>	Wooster,	Canton, O.
J. H. Westcott, <sup>14</sup>	Princeton,	Philadelphia.
B. F. Wilson, <sup>2</sup>	Davidson,	Mayesville, S. C.
S. E. Young, <sup>1 9</sup>	Westminster,	High Point, Mo.

GRADUATE STUDENTS, . . . . . 88.



GRADUATE COURSES.

I. DEPARTMENT OF PHILOSOPHY.

- 1. *Discussions in Contemporary Philosophy*, THE PRESIDENT.
- 2. *Ethics*, PROF. PATTON.
- 3. [*History of English Ethics*, PROF. PATTON.]
- 4. *Plato's Philosophy*, PROF. ORRIS.
- 5. *Modern Philosophy*, PROF. ORMOND.
- 6. *Historical Methods and Systems*, PROF. SLOANE.
- 7. *Common Law*, PROF. JOHNSTON.
- 8. *Homeric Archæology*, PROF. MARQUAND.
- 9. *Assyrian Archæology*, PROF. FROTHINGHAM.
- 10. *Pedagogics*, PROF. WEST.

## II. DEPARTMENT OF LITERATURE.

11. *Sources of Early Roman Law*, PROF. PACKARD.
12. *Dramatic Literature*, PROF. MURRAY.
13. [*Anglo-Saxon*, PROF. HUNT.]
14. *Sanskrit*, PROF. WINANS.

## III. DEPARTMENT OF SCIENCE.

20. *Differential Equations*, PROF. FINE.
21. *Higher Geometry*, PROF. FINE.
22. [*Theory of Functions*, PROF. FINE.]
23. *Astronomy*, PROF. YOUNG.
24. *Physics*, PROF. BRACKETT.
25. *Math. Physics*, PROF. MAGIE.
26. *Lab. Chemistry*, PROF. CORNWALL.
27. *Mineralogy*, PROF. CORNWALL.
28. *Biology*, PROF. MACLOSKEY.
29. *Hist. Paleontology and Embryology*, PROF. SCOTT.
30. [*Comparative Vertebrate Anatomy*, PROF. OSBORN.]
31. *Histology*, PROF. LIBBEY.
32. *Civil Engineering*, PROF. McMILLAN.

## OPTIONAL COURSES.

## SENIOR YEAR.

1. *Modern Philosophy*, PROF. ORMOND.
2. *Roman Law*, PROF. JOHNSTON.
3. [*Constitutional History of United States*, PROF. JOHNSTON.]
4. *Justinian's Institutes*, PROF. PACKARD.
5. *Assyrian Archaeology*, PROF. FROTHINGHAM.
6. [*English Literature*, PROF. MURRAY.]
7. [*Geology*, PROF. SCOTT.]
8. [*Embryology*, PROF. SCOTT.]
9. [*Physical Geography*, PROF. LIBBEY.]
10. [*Histology*, PROF. LIBBEY.]

## JUNIOR YEAR.

1. *Greek Mythology*, PROF. MARQUAND.
2. *Suetonius*, PROF. PACKARD.
3. *Æschylus*, PROF. ORRIS.
4. [*Thucydides*, PROF. WINANS.]
5. [*Latin Poets*, PROF. WEST.]

## SOPHOMORE YEAR.

1. *English*, PROF. HUNT.

## FRESHMAN YEAR.

1. *Cornelius Nepos*, MR. WESTCOTT.

NOTE.—The courses in brackets are offered during the Second and Third Terms.



## ACADEMIC DEPARTMENT.

## PROFESSORS.

## I. DEPARTMENT OF PHILOSOPHY.

1. THE PRESIDENT. *Modern Philosophy and Metaphysics.*
2. PROF. PATTON. *Ethics.*
3. PROF. ORMOND. *History of Philosophy, Logic and Psychology.*
4. PROFS. SCOTT AND OSBORN. *Physiological Psychology.*
5. PROF. SHIELDS. *Harmony of Science and Religion.*
6. PROF. SLOANE. *History and Political Science.*
7. PROF. JOHNSTON. *Jurisprudence and Political Economy.*
8. PROFS. PRIME, MARQUAND AND FROTHINGHAM. *History of Art and Archæology.*

## II. DEPARTMENT OF LANGUAGE AND LITERATURE.

1. PROFS. CAMERON, ORRIS AND WINANS. *Greek.*
2. PROFS. PACKARD, WEST AND MR. WESTCOTT. *Latin.*
3. PROFS. MURRAY, HUNT AND RAYMOND. *English.*
4. PROF. KARGÉ AND MR. BALDWIN. *French and German.*
5. PROF. HUNT. *Anglo-Saxon.*
6. PROF. WINANS. *Sanskrit.*

## III. DEPARTMENT OF MATHEMATICS AND SCIENCE.

1. PROFS. DUFFIELD, FINE AND DR. CARMAN. *Mathematics.*
2. PROFS. YOUNG AND MCNEILL. *Astronomy.*
3. PROFS. BRACKETT AND MAGIE. *Physics.*
4. PROFS. SCHANCK, CORNWALL AND DR. MCCAY. *Chemistry.*
5. PROFS. SCHANCK, MACLOSIE, SCOTT, OSBORN AND MR. PHILLIPS. *Biology.*
6. PROF. MACLOSIE. *Botany.*
7. PROF. LIBBEY. *Histology and Physical Geography.*
8. PROFS. SCOTT AND OSBORN. *Geology and Palæontology.*

## UNDERGRADUATES.

---

### SENIOR CLASS.

John Erskine Adams,	Augusta, Ga.,	11 S W
Wilson Shaw Arbuthnot,	Pittsburgh, Pa.,	A, U H
George Titus Berry,	Caldwell, N. J.,	14 N E
Robert Wm. Blake,	Princeton, N. J.,	Mr. Blake's
Robert R. P. Bradford,	Dover, Del.,	4 E M W H
Stewart Brown,	New York City,	10 E W H
Charles Shepard Bryan,	New Berne, N. C.,	4 E M W H
Wilmot Albert Carrington,	Washington, D. C.,	14 S M R H
Arthur Mills Corwin,	Racine, Wis.,	Mrs. Stockton's
George McLean Cummings,	Baltimore, Md.,	10 N E H
John H. Denny,	Baltimore, Md.,	Mrs. Warren's
James Parker Dodd,	Newark, N. J.,	6 E M W H
Samuel Thompson Dodd,	Garfield, N. Y.,	5 S E
Wm. S. Dodd,	Bloomfield, N. J.,	18 U H
James Walter Doughty,	Circleville, O.,	68 Brown Hall
Wm. John Duane,	New York City,	46 U H
Herbert Elder,	Harrisburg, Pa.,	35 N E H
John Wilson Elder,	Clarion, Pa.,	C, U H
Eugene Maurice Fitzgerald,	Washington, D. C.,	14 N W
Robert Gilchrist, Jr.,	Jersey City, N. J.,	46 U H
Harry Lomison Goehring,	Irwin, Pa.,	C, U H
Edward Field Goltra,	Jacksonville, Ill.,	8 W W H
Wm. Thompson Graham,	Philadelphia, Pa.,	7 S R H
Clarence Halstead,	Cincinnati, O.,	7 S W
H. C. Heverin,	Philadelphia, Pa.,	4 S R H
Robert James Hunt,	Trenton, N. J.,	Trenton
Solomon Stanger Iszard,	Glassboro, N. J.,	9 N E

John Martin Jamison,	Greensburg, Pa.,	17 & 20 S E H
Roger Bruce Cash Johnson,	Nassau, W. I.,	16 N E
C. P. F. Joyce,	Washington, D. C.,	Mrs. Wolfe's
George Armstrong Kelly, Jr.,	Pittsburgh, Pa.,	5 E M W H
Adrian Hoffman Larkin,	Sing Sing, N. Y.,	19 E W H
Mark Harvey Liddell,	Clearfield, Pa.,	8 S M R H
James Henry Lockhart,	Pittsburgh, Pa.,	E, U H
Charles Hill Macloskie,	Princeton, N. J.,	Prof. Macloskie's
Robert William Mason,	East Norwood, O.,	17 N
Paul Matthews,	Washington, D. C.,	Miss Smith's
Frank Keller McCance,	Allegheny City, Pa.,	D, U H
Charles E. McGinnes,	Joy, Ill.,	Mrs. Priest's
Peter McHarg McQueen,	Kirkdale Bank, Scotland,	13 S M R H
Albert Lincoln Mershon,	Newark, N. J.,	13 N E
John Izard Middleton, Jr.,	Baltimore, Md.,	9 W W H
Wm. Watts Montgomery, Jr.,	Augusta, Ga.,	8 W W H
M. H. Morgan,	New York City,	17 E W H
William Montgomery Nichol,	Indiana, Pa.,	19 N E
Lyman Halter Nutting,	Lebanon, Pa.,	5 N E
Gordon Paddock,	New York City,	7 W W H
James Paige,	Minneapolis, Minn.,	32 N E H
Albert George Parker,	Oswego, N. Y.,	26 N
Hamilton Parrish,	New York City,	15 N W
David Graham Phillips, Jr.,	Madison, Ind.,	11 W W H
Horace Marshal Porter,	New York City,	7 N E
Robert Edgar Porterfield,	Mendota, Ill.,	Mrs. Stockton's
John Wahl Queen, Jr.,	Mount Pleasant, N. J.,	9 N E
Francis Ellison Reid,	Urbana, O.,	19 S E
George Livingstone Robinson,	West Hebron, N. Y.,	16 N
Clarence William Rouse,	W. New Brighton, N. Y.,	19 S W
Henry Seymour Savage,	Virginia, Ill.,	D, U H
Alfred Hedges Scofield,	Budd's Lake, N. J.,	25 N
George Beale Sloan, Jr.,	Oswego, N. Y.,	11 U H
Frank Hyatt Smith,	Detroit, Mich.,	Mrs. Hubbard's
Franklin Spencer Spalding,	Denver, Colo.,	4 S E H
William Marvin Spalding,	Denver, Colo.,	10 S W
Louis Stearns,	New York City,	8 W M W H

Isaac Lanning Van Schoick,	Perrineville, N. J.,	10 S R H
Lucien Waggener, Jr.,	Frankfort, Ky.,	Miss Smith's
Charles Hurlbut Whitaker,	Bismarck, D. T.,	13 N E
Francis Harding White,	Washington, D. C.,	10 S R H
Joseph White Williams,	Paterson, N. J.,	8, U H
Hallam Gregory Williamson,	Washington, D. C.,	Mrs. Wolfe's

SENIORS, . . . . . 70.

### JUNIOR CLASS.

Robert Staunton Adams,	Brooklyn, N. Y.,	8 W M W H
Horace Anderson,	Indianapolis, Ind.,	19 S M R H
John W. Ballantine,	Hamden, N. Y.,	11 N M R H
Frederick Griswold Beebe,	Port Byron, N. Y.,	2 N R H
James Seguin de Benneville,	Philadelphia,	2 W W H
Charles Newbold Black, Jr.,	New York City,	11 S E
Collins Pechin Bliss,	New York City,	7 E W H
Edgar Sumner Bliss,	Philadelphia,	34 N E H
David Dandie Brough,	Providence, R. I.,	8 N M R H
Henry Irick Budd, Jr.,	Mt. Holly, N. J.,	1 N M R H
Ernest T. Carter,	Orange Valley, N. J.,	8 W M W H
Russell Carter,	Montclair, N. J.,	13 S W
James Robb Church,	Washington, D. C.,	3 S R H
Hector William Cowan,	Hobart, N. Y.,	11 N M R H
Calvin Bradley Crafts,	Tallahassee, Fla.,	50 U H
Winthrop More Daniels,	Dayton, O.,	1, U H
Hugh Trowbridge Dobbins,	West Berkeley, Cal.,	10 N E
Frederick L. Drummond,	Newark, N. J.,	9 S R H
Livingston Farrand,	Newark, N. J.,	26 S E H
John Fieldhouse Fenton,	Trenton, N. J.,	2 N R H
William Holmes Forsyth,	Princeton, N. J.,	Mr. Forsyth's
• John Fraser, Jr.,	Philadelphia,	2 N E H
† Wm. Fryling,	Newark, N. J.,	11 N
Kemper Fullerton,	Georgetown, D. C.,	6 N W

† Under conditions.

James Diverty Godfrey,	Millville, N. J.,	12 N W
Robert Halstead,	Cincinnati, O.,	7 S W
Thomas Benton Hamilton,	Columbus, O.,	5 E W H
James Hancock,	Philadelphia,	5 W M W H
†Osmund Howard Harvey,	Baltimore, Md.,	17 W W H
Charles James Hatfield,	Pottstown, Pa.,	7 N R H
Benjamin V. D. Hedges,	Chester, N. J.,	12 S E
E. Hicks Herrick,	New York City,	7 E M W H
Samuel Colgate Hodge,	Hartford, Conn.,	7 N R H
William Ledyard Hodge,	Washington, D. C.,	3 S R H
Edwin Mortimer Hopkins,	Carmel, N. Y.,	15 N M R H
George Wallace Hutchinson,	Windsor, N. J.,	14 S E
William Mann Irvine,	Bedford, Pa.,	10 N M R H
Wm. Hallock Johnson,	New York City,	18 S E
Charles Leonard Jones,	Allegheny City, Pa.,	7 S M R H
Samuel J. King,	Washington, D. C.,	7 N M R H
Robert Hutchinson Kirk,	Lancaster, Pa.,	4 S M R H
Frederick Jay Knox,	Bloomfield, N. J.,	18 S W
Charles Williston McAlpin,	New York City,	12 W W H
Thomas Nesbitt McCarter, Jr.,	Newark, N. J.,	6 N M R H
Chas. F. W. McClure,	Boston, Mass.,	5 W M W H
Robert Winters McGregor,	Dayton, O.,	I, U H
Porter Robert McMaster,	Greenwich, N. Y.,	18 N W
George Whitfield McMillan,	Perrineville, N. J.,	15 N M R H
John McMillan,	Pittston, Pa.,	19 S E
Howard McWilliams,	Brooklyn, N. Y.,	4 W W H
Richard Waln Meirs,	Hornerstown, N. J.,	7 S E
Ulysses Mercur, Jr.,	Towanda, Pa.,	8 E M W H
Andrew Harold Miller,	Philadelphia,	9 E M W H
Junius Spencer Morgan, Jr.,	New York City,	16 W W H
Archibald Robertson Osmer,	Franklin, Pa.,	12 N M R H
Thomas Marc Parrott,	Dayton, O.,	6 N R H
James Hammond Pershing,	Stauffer, Pa.,	16 S E
T. McClure Peters,	New York City,	8 E M W H .
Daniel Walter Phelan,	Gillette, N. J.,	17 N E H
Celsus Pomerene,	Berlin, O.,	Mrs. King's
Lister Pomerene,	Berlin, O.,	Mrs. King's

Luther Edmunds Price,	Cape May City, N. J.,	16 S W
William Cozens Price,	Cape May City, N. J.,	16 S W
Ralph Earl Prime, Jr.,	Yonkers, N. Y.,	15 S E
Evans Tulane Richardson,	Staunton, Va.,	17 S M R H
Elliott Verne Richardson,	Trenton, N. J.,	9 N E H
Jacob Riegel,	Philadelphia,	14 W W H
Theodore Kepner Rinehart,	Americus, Kansas,	36 S E H
Peter Rioseco,	Philadelphia,	14 N M R H
William Courtland Robinson,	Delhi, N. Y.,	13 N W
Walter Willard Ross,	Hamilton, Mo.,	6 W M W H
William Henry Runyon,	Millington, N. J.,	16 S E
George E. Scott,	Newark, N. Y.,	8 N R H
Charles Alvin Smith,	Philadelphia,	18 N
Charles Sidney Smith,	Washington, D.C.,	Mr. Hudnut's
William Emery Studdiford,	Trenton, N. J.,	5 S R H
Arthur Pemberton Sturges,	New York City,	8 E W H
James Frederick Talcott,	New York City,	15 W W H
John Benton Thomas,	Princeton, N. J.,	Mr. Thomas'
Stephen G. Thomas,	Princeton, N. J.,	Mr. Thomas'
Charles W. Van Dyke,	Cranbury, N. J.,	19 N W
George B. Westcott Van Dyke,	Cranbury, N. J.,	19 N W
Ellwood O. Wagenhurst,	Clifton, Pa.,	3 N M R H
Frank Allan Waterman,	Fulton, N. Y.,	17 S E
William Wisner White,	Summit, N. J.,	10 N E
†Chas. Barnes Williams,	Uniontown, Pa.,	42 N E H
Tennis Williamson,	Flatbush, L. I.,	6 W M W H
Walter Augustus Wyckoff,	Jullunder City, India,	6 N W
Edward Yeomans,	Orange, N. J.,	19 N E H

JUNIORS, . . . . . 89.

#### SOPHOMORE CLASS.

Maitland Alexander,	New York City,	10 S E
William Patterson Atkinson,	Philadelphia,	15 S E H
Richmond Ogston Aulick,	Washington, D. C.,	5 S W
Andrew Banks,	Mifflin, Pa.,	10 N R H

Alf. Hamilton Barr,	Petersburg, Pa.,	10 N R H
Samuel McKean Bayard,	Germantown, Pa.,	20 N W
Eugene Walker Belknap,	Newburgh, N. Y.,	3 E M W H
James Clark Bennett, Jr.,	Cape May City, N. J.,	9 N M R H
David Bovaird, Jr.,	Bradford, Pa.,	8 W W H
William Coughlin Braislin,	Crosswicks, N. J.,	14 S E H
R. Desha Breckinridge,	Lexington, Ky.,	16 E W H
John Milton Putnam Brooks,	Cleveland, O.,	10 E M W H
J. Prentiss Browning,	Cooperstown, N. Y.,	2 W M W H
Arthur Audley Brownlee,	Indiana, Pa.,	7 N W
G. Herbert Carter,	Huntington, N. Y.,	31 N E H
Wm. S. Chase,	Akron, O.,	9 W M W H
Isaac Parker Coale,	Arch Spring, Pa.,	32 S E H
Henry Workman Connor,	Charleston, S. C.,	75 U H
William Judson Cook,	Sheridan, N. Y.,	7 N W
James Denuis Denègre,	Frederick City, Md.,	11 N E
Harry Gurnee Drummond,	Newark, N. J.,	9 S R H
William Edward Durell,	Woodstown, N. J.,	25 N E H
J. Seymour Emans,	Poughkeepsie, N. Y.,	27 S E H
Llewellyn Stover Fulmer,	Philadelphia,	20 U H
Sidney Dale Furst,	Lock Haven, Pa.,	12 N E
James M. Gayley,	Philadelphia,	11 N E
Joshua Brush Gesner,	Linden, N. J.,	3 N R H
Geo. E. Gillespie,	Elizabeth, N. J.,	21 S E H
Malbone Watson Graham,	Dubuque, Iowa,	4 N M R H
J. Charles Gray,	Washington, D. C.,	14 and 15 U H
Norman Grey,	Salem, N. J.,	25 S E H
Alexander Reading Gulick,	Princeton, N. J.,	24 N
Albert Halstead,	Cincinnati, O.,	8 S W
Edward Ringwood Hewitt,	New York City,	20 E W H
†James Hunter,	New York City,	6 N E
Harry Clay Irons,	Lakewood, N. J.,	38 S E H
William Sherman Jenney,	Syracuse, N. Y.,	3 E M W H
Frank Snowden Katzenbach, Jr.,	Trenton, N. J.,	5 N R H
Victor Kauffmann,	Washington, D. C.,	10 N W
William Howard King,	Princeton, N. J.,	Mrs. King's
Furman Kneeland,	Brooklyn, N. Y.,	—

Robert Henry Life,	Rye, N. Y.,	24 N
Alvin Carr McCord,	Minneapolis, Minn.,	10 S E H
George Grenville Merrill,	New York City,	Mr. Goldie's
William Laing Merrill,	New York City,	Mr. Goldie's
Frederick Shepard Minot,	New York City,	6 S W
Clarence Blair Mitchell,	Lakewood, N. J.,	13 W W H
Lewis S. Mudge,	Princeton, N. J.,	Mr. Mudge's
Fred Neher,	Troy, N. Y.,	5 N R H
†Henry Graves Noel,	St. Louis, Mo.,	4 N E H
William M. Paxton, Jr.,	Princeton, N. J.,	14 E W H
Clifford Chandler Pollison,	Waverly, N. J.,	17 N W
John Williams Proudfit,	Baltimore, Md.,	20 E W H
Edward Watson Rand,	Baltimore, Md.,	9 S E
Edmund Yard Robbins,	Asbury Park, N. J.,	16 N
Philip Ashton Rollins,	Philadelphia,	17 U H
Thomas Henry Powers Sailer,	Philadelphia,	10 S M R H
William Hedges Scofield,	Budd's Lake, N. J.,	25 N
†Willard Blossom Segur,	Andover, Mass.,	7 N E H
Irenaeus M. Shepherd,	Trenton, N. J.,	20 U H
J. Condit Smith,	Fredonia, N. Y.,	N, U H
William Walter Smith,	Elizabeth, N. J.,	17 N W
Robert Eliot Speer,	Huntingdon, Pa.,	19 W W H
Gormly J. Sproull,	Brooklyn, N. Y.,	11 S M R H
Thomas Sproull,	Brooklyn, N. Y.,	11 S M R H
James Frederick Stebbins,	Geneva, N. Y.,	12 N E
Charles Wadham Stevens,	New York City,	14 and 15 U H
Duncan Warren Taylor,	Princeton, N. J.,	Mrs. Taylor's
John Alvin Terhune,	Saddle River, N. J.,	9 S E
C. F. Uebelacker,	Morristown, N. J.,	1 E M W H
C. Doremus VanWagenen, Jr.,	New York City,	13 U H
Howard Crosby Warren,	Montclair, N. J.,	10 E M W H
Bertram Howard Waters,	Pittsburgh, Pa.,	6 S R H
Thomas Brown Whitney,	Philadelphia,	Mr. Van Syckel's
James Edwards Wyckoff,	Jullunder City, India,	19 S W



## FRESHMAN CLASS.

Benjamin Haywood Adams,	Elizabeth, N. J.,	3 N R H
Henry Martyn Alexander, Jr.,	New York City,	6 S E
†Horace Leon Allen,	Jersey City, N. J., Mrs. Thomas'	
Knowlton Lyman Ames,	Chicago, Ill.,	U H
Arthur Sterling Auchincloss,	Orange, N. J.,	4 W M W
James McClure Barnett,	New Bloomfield, Pa.,	8 S E H
Oliver Shepard Barnum,	Thompsonville, Conn.,	28 N E H
†Edgworth Bird Baxter,	Sparta, Ga.,	5 S M R H
George Greene Belt,	Cedar Rapids, Ia.,	U H
Charles G. Bickham,	Dayton, O.,	16 N W
George Hooper Bigelow,	San Francisco, Cal.,	40 N E H
J. Warren Bird,	Trenton, N. J.,	9 N W H
Clinton Ledyard Blair,	Belvidere, N. J.,	16 E W H
Alex. N. Bodine,	Philadelphia,	18 E W H
Ernest Ludlow Bogart,	Yonkers, N. Y.,	80 U H
†Charles L. Brackett,	Minneapolis, Minn.,	30 S E H
Willard Hall Bradford,	Dover, Del.,	Mrs. King's
John Bright,	Pottsville, Pa.,	O, U H
William Adams Britton,	New York City,	F, U H
Thos. Brown, Jr.,	Princeton, N. J.,	Mr. Brown's
John Calvin Bucher,	Dillsburg, Pa.,	1 S R H
Edward Phillips Burgess, Jr.,	Dedham, Mass.,	79 U H
Dan Dillon Casement,	Painesville, O.,	9 W M W H
Tileston Fracker Chambers,	Washington, D. C.,	18 U H
Henry Judson Chapin, Jr.,	New York City,	4 N R H
James Jeffries Charlton,	Albany, Oreg.,	13 N
Albert Ward Cobb,	Sing Sing, N. Y.,	68 U H
Addison Berg Collins,	Philadelphia,	24 S E H
Arthur James Collins,	Sheridan, N. Y.,	10 N M R H
William Shubael Conant,	Princeton, N. J.,	14 S W
John Paul Conduit,	Franklin, N. J.,	Mrs. Lavake's
Henry Brundage Culver,	Brick Church, N. J.,	67 U H
John Frederick Degener, Jr.,	New York City,	77 U H
Henry Kreider Denlinger,	Gordonville, Pa.,	1 S R H

† On trial.

Walter Charles Dohm,	Princeton, N. J.,	Mr. Dohm's
†George Blakely Easton,	Peoria, Ill.,	—
David Linn Edsall,	Hamburg, N. J.,	9 U H
Richard Everett Edsall,	Hamburg, N. J.,	—
Wm. Bradford Ewing,	Alexandria, Egypt,	18 S M R H
James Edward Farnam,	Media, Pa.,	G. U H
James McCullough Farr, Jr.,	New York City,	18 N M R H
Stephen Church Flinn,	Albany, Oreg.,	13 N
William Sanderson Furst,	Bellefonte, Pa.,	R, U H
Herbert Mortimer Gesner,	Linden, N. J.,	5 N M R H
Wm. Dwight Gibby,	Princeton, N. J.,	Mr. Gibby's
Malcolm Graham, Jr.,	New York City,	10 W M W H
Craig Reasoner Guerin,	Morristown, N. J.,	38 U H
Alexander Smith Guffey,	Greensburg, Pa.,	16 S E H
Harry Walter Haring,	Philadelphia,	22 S E H
Harlie Wallace Hathaway,	Jersey City, N. J.,	Mrs. Easton's
George Edward Hersh,	York, Pa.,	Mrs. Ferguson's
Abner Smith Hires,	Quinton, N. J.,	26 N E H
Jesse Watson Hirst,	Fall River, Mass.,	33 S E H
Charles Hodge,	Wilkes-Barre, Pa.,	K, U H
Richard Irvin,	Troy, N. Y.,	20 E W H
Charles Huntington Jackson,	Newark, N. J.,	2 S R H
Hugh Hartshorne Janeway,	New Brunswick, N. J.,	41 U H
Joseph R. Kerr, Jr.,	New York City,	Mr. Goldie's
Winfield Smith Kimball,	Eatontown, N. J.,	Mrs. Warren's
Fred. John Krapp,	Buffalo, N. Y.,	18 N E H
David Chambers Lewis,	Portland, Oreg.,	16 U H
Joseph William Lewis, Jr.,	St. Louis, Mo.,	3 and 4 U H
Louis Eugene Livingood,	Reading, Pa.,	10 U H
Walter Lowrie,	Philadelphia,	14 S W
Frank Lukens,	Elizabeth, N. J.,	8 S R H
William Harvey Lytle,	Princeton, N. J.,	Dr. Lytle's
Henry Alexander McConkey,	Peach Bottom, Pa.,	Mrs. Newton's
Richard Stephen McCreery,	Washington, D. C.,	60 U H
Mark Lindsey McDonald, Jr.,	Santa Rosa, Cal.,	62 U H
A. Hart. McKee,	Allegheny City, Pa.,	1 U H
Malcolm McLaren,	Princeton, N. J.,	Mrs. McLaren's

R. Mann, Jr.,	Mill Hall, Pa.,	72 U H
James Mathers,	Mifflintown, Pa.,	19 U H
DeWitt Clinton Morris,	Elizabeth, N. J.,	4 N R H
V. Van Arsdale Nicholas,	Somerville, N. J.,	23 S E H
Edwin Nicodemus,	Boonsboro', Md.,	40 U H
Newton Fassett Osmer,	Franklin, Pa.,	12 N M R H
Franklyn Paddock,	New York City,	Mr. Goldie's
Frank Palmer,	Swampscott, Mass.,	79 U H
Howard W. Perrin,	Luzerne, Pa.,	Mrs. Priest's
William Lee Phelps,	Springfield, O.,	Mrs. Easton's
Delavan Leonard Pierson,	Philadelphia,	18 S E H
Eugene Blackburn Price,	Cincinnati, O.,	33 U H
William Cowper Prime,	Yonkers, N. Y.,	15 S E
Alfred Charles Post Quimby,	Jersey City, N. J.,	Mrs. Thomas'
John H. Race,	Kingston, Pa.,	Mrs. Priest's
Edmund Grindall Rawson, Jr.,	Albany, N. Y.,	5 S E H
Albert Reid,	Englishtown, N. J.,	13 N E H
Thomas Maurer Roe,	Reading, Pa.,	17 S W
William Mapes Rysdyk,	Goshen, N. Y.,	38 N E H
George Schoonmaker,	Bruynswick, N. Y.,	33 S E H
Charles Hamilton Shadle,	Kittanning, Pa.,	Mr. Thomas'
James Madison Sharon,	McAlisterville, Pa.,	1 S E H
George Louis Shearer,	San Francisco, Cal.,	27 N
Spencer Howell Shepard,	New York City,	P, U H
Robert Porter Shick,	Reading, Pa.,	17 S W
Reginald Kearney Shober,	Philadelphia,	Mr. Goldie's
Arthur Melville Shrady,	New York City,	76 U H
Edwin Withers Shultz,	Kirkwood, Pa.,	Mrs. Burroughs'
Isaac Butler Smith,	Cedar Rapids, Iowa,	U H
Louis Dean Speir,	S. Orange, N. J.,	Mrs. Stonaker's
Chas. George Sproull,	Jacksonville, Fla.,	43 U H
Morris Crater Sutphen,	Morristown, N. J.,	21 N E H
Joseph Holden Sutton,	New York City,	18 N W
Joseph N. Thomas,	Santa Rosa, Cal.,	62 U H
Robert T. Townsend,	New Brighton, Pa.,	6 S R H
†T. E. Van Ausdal,	Dayton View, Dayton, O.,	16 N W
J. Spencer Van Cleve,	Erie, Pa.,	10 S W

SPECIAL STUDENTS.

James Ditmars Voorhees,	Morristown, N. J.,	1 E M W H
Frederick Morton Wall,	New York City,	Mrs. Thomas'
Frederick John Watson,	Cairo, Egypt,	41 S E H
Grant Weidman, Jr.,	Lebanon, Pa.,	5 U H
George Silas West,	Princeton, N. J.,	19 S E H
Charles Albert Woods,	Pittsburgh, Pa.,	64 and 65 U H
†Lawrence Crane Woods,	Pittsburgh, Pa.,	64 and 65 U H
Howard Wright,	Princeton, N. J.,	Mr. J. Wright's
†John Hankins Wright,	Princeton, N. J.,	Mr. T. Wright's
John Morris Yeakle,	Norristown, Pa.,	20 N E
Irving Elmer Ziegler,	Kulpsville, Pa.,	39 N E H

FRESHMEN, . . . . . 119.

SPECIAL STUDENTS.

NOT CANDIDATES FOR A DEGREE.

Frank Delaplaine Carpenter,	Wilmington, Del.,	9 N R H
William F. Dix,	Newark, N. J.,	B, U H
H. Ward Ford,	Morristown, N. J.,	N, U H
Henry H. Forsyth, Jr.,	Princeton, N. J.,	Mr. Forsyth's
William James George,	Scroggsfield, O.,	6 N E
Alfred Sherman Hartz,	Peoria, Ill.,	2 S E H
David Walter McCord,	Minneapolis, Minn.,	10 S E H
Wm. Herron McCulloch,	Peoria, Ill.,	Mrs. Lavake's
Harry Hatton McMahon,	Cambridge, O.,	12 S M R H
Hugh T. Mathers,	Sidney, O.,	19 U H
John Preston Brown Perkins,	Nashville, Tenn.,	14 S E H
John Van Ness Philip,	Washington, D. C.,	6 E W H
W. M. Pitts,	Indiana, Pa.,	19 N E
Edmund F. Quinn,	Eaton, O.,	Miss Leigh's
Lowry Witherspoon Sibbet,	Shippensburg, Pa.,	10 N
William L. Sidler,	Danville, Pa.,	18 S W
David F. Stakes,	Germantown, Pa.,	1 S M R H
Garret Voorhees Stryker,	Rocky Hill, N. J.,	9 S E H
Ferris S. Thompson,	New York City,	15 E W H

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Harry Walter Tolson,	Philadelphia,	22 N E H
John R. Vance,	Mahoningtown, Pa.,	42 S E H
James Wilson Williams,	Berwyn, Pa.,	15 S M R H
Stuart R. Young,	Louisville, Ky.,	42 U H
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THE  
JOHN C. GREEN SCHOOL OF SCIENCE.

---

JAMES McCOSH, PRESIDENT, *Psychology*.

JAMES O. MURRAY, DEAN, *English Literature and Language*.

J. STILLWELL SCHANCK, *General Chemistry*.

CYRUS F. BRACKETT, *Physics*.

HENRY B. CORNWALL, *Analytical Chemistry and Mineralogy*.

GEORGE MACLOSIE, *Botany, Zoölogy, Biblical Instruction*.

CHARLES McMILLAN, *Civil Engineering*.

CHARLES A. YOUNG, *Astronomy*.

CHARLES G. ROCKWOOD, JR., *Mathematics*.

THEODORE W. HUNT, *Rhetoric, English Language*.

GEORGE L. RAYMOND, *Oratory and Æsthetic Criticism*.

WILLIAM LIBBEY, JR., *Histology*.

WILLIAM B. SCOTT, *Geology*.

HENRY F. OSBORN, *Comparative Anatomy*.

FREDERICK N. WILLSON, *Descriptive Geometry, Stereotomy,  
Drawing*.

ALEXANDER T. ORMOND, *Logic*.

ALEXANDER JOHNSTON, *Political Economy*.

HERMANN C. O. HUSS, *French, German*.

WILLIAM F. MAGIE, *Physics*.

H. S. S. SMITH, *Civil Engineering*.

MALCOLM McNEILL, *Practical Astronomy*.

LEROY W. McCAY, *Analytical Chemistry*.

JOHN W. PHILLIPS, *Biology*.

**UNDERGRADUATES.****SENIOR CLASS.**

I. Candidates for B. S. II. For C. E.

II. Thomas Francis Bedle,	Jersey City, N. J.,	10 W W H
II. Francis Ogden Blackwell,	New York City,	3 W M W H
I. Frank Enos,	Brooklyn, N. Y.,	6 F M W H
I. David Greene,	Columbus, O.,	7 W M W H
II. F. Wolcott Jackson, Jr.,	Newark, N. J.,	11 N W
I. George Pierson Jessup,	Oneida, N. Y.,	11 S W
I. William Larimer Jones,	Pittsburgh, Pa.,	11 E W H
I. Samuel Roseburg Kelly,	Pittsburgh, Pa.,	5 N M R H
I. James G. Ludlum,	Pompton, N. J.,	9 S M R H
I. A. H. Phillips,	Lawrenceville, N. J.,	12 S E H
II. Clinton Levering Riggs,	Baltimore, Md.,	7 W M W H
II. David Frederick Walker, Jr.,	Salt Lake City, Utah,	5 N W

SENIORS, . . . . . 12.

**JUNIOR CLASS.**

I. Stephen Weart Blackwell,	Trenton, N. J.,	5 S R H
II. Wm. J. J. Bowman,	Trenton, N. J.,	9 S E H
I. Homer E. Fraser,	Fowlerville, N. Y.,	8 N R H
I. Francis M. Frazer,	Newark, N. J.,	1 W M W H
I. John Calvin Graham, Jr.,	Montgomery, Ala.,	8 N E
II. Francis Henry,	Princeton, N. J.,	Mr. Henry's
II. Conrad Hewitt,	Trenton, N. J.,	3 E W H
I. Thomas E. Inslee,	Newton, N. J.,	15 N E
I. Frank Jones King,	Pittsburgh, Pa.,	45 U H
II. John Elliot Nicholson,	New York City,	6 W W H
I. Thornton Floyd Turner,	Englewood, N. J.,	48 U H

JUNIORS, . . . . . 11.

**SOPHOMORE CLASS.**

II. Jason Rogers Barr,	Louisville, Ky.,	9 S W
II. Wm. Roscoe Bonsal,	Baltimore, Md.,	18 W W H

II.	William Daniel Bratton,	Elkton, Md.,	H, U H
II.	Frederick Joseph Church,	Hudson, N. Y.,	20 S E
I.	Byron S. Clarke,	Brooklyn, N. Y.,	2 W M W H
I.	A. Edward Conover, Jr.,	New York City,	20 S W
I.	George Kerr Edwards,	Washington, D. C.,	18 E W H
I.	Theodore Granger Gordon,	Columbus, O.,	L, U H
II.	George Louis Hall,	Bedford, Pa.,	L, U H
I.	Thomas W. Hotchkiss, Jr.,	Elmira, N. Y.,	13 N E H
I.	Thomas McKee McKee,	Allegheny, Pa.,	1 U H
I.	William B. McLean,	Shippensburg, Pa.,	15 S W
II.	Chas. Jenkins Montgomery,	Augusta, Ga.,	Mrs. Fine's
II.	Jos. Chandler Morris, Jr.,	New Orleans, La.,	Mrs. Lavake's
I.	William Boswell Mount,	Philadelphia,	27 N E H
I.	Thomas Clarence Noyes,	Washington, D. C.,	—
I.	Cyrus Long Pershing,	Pottsville, Pa.,	18 S E
I.	John Eliot Shrady,	New York City,	20 S W
I.	Henry Dorr Sill,	Cooperstown, N. Y.,	2 E W H
II.	Lewis Mudge Smith,	Princeton, N. J.,	Mrs. Smith's
I.	Perry Walton,	Newark, N. J.,	18 S E
I.	Arthur Dix Windsor,	Titusville, Pa.,	Mr. T. Brown's

SOPHOMORES, . . . . . 22.

### FRESHMAN CLASS.

II.	†Andrew Jackson Allen,	Blairsville, N. J.,	20 N E
II.	†Frank Brown,	Philadelphia,	Mrs. Anderson's
I.	Charles Jenney Chambers,	Philadelphia,	61 U H
II.	Roscoe Henry Channing, Jr.,	Plainfield, N. J.,	36 N E H
I.	Edwin A. Dalton,	Le Mars, Iowa,	T, U H
I.	Wm. Vance Dinsmore,	Bloomington, Ill.,	74 U H
II.	Wilbur Chapman Fisk,	New York City,	12 E W H
II.	George Goldie, Jr.,	Princeton, N. J.,	Mrs. Goldie's
I.	Fred'k Wm. Hagney,	Newark, N. J.,	29 S E H
I.	Bernard Shea Horne,	Pittsburgh, Pa.,	73 U H
I.	Albert Gould Jennings,	Brooklyn, N. Y.,	M, U H
I.	Albert Edward Kennedy,	Philadelphia,	12 U H

† Not fully examined.



I. Paul Foster Leach,	Philadelphia,	Mrs. Warren's
I. Clarence Edward Lemassena,	Newark, N. J.,	1 W W H
I. Robert C. Lewis,	New York City,	23 N E H
I. Victor Courtenay Lewis,	Chicago, Ill.,	29 N E H
I. †J. Ralston McKelvy,	Pittsburgh, Pa.,	70 U H
I. Chas. Richard McMillan,	Princeton, N. J.,	Prof. McMillan's
I. Wm. Passmore Meeker,	Newark, N. J.,	28 S E H
I. Chas. Howard Miner,	Wilkes-Barre, Pa.,	K. U H
II. Harry Otis Nutting,	Lebanon, Pa.,	39 U H
II. W. P. Nutting,	Lebanon, Pa.,	5 N E
II. Chas. Pope O'Fallon,	St. Louis, Mo.,	3 and 4 U H
II. Howard Crathorne Phillips,	New York City,	31 U H
II. Frederic Vernon Pitney,	Morristown, N. J.,	Dr. Macdonald's
II. George Van Dusen Rickert,	Pottsville, Pa.,	66 U H
I. Charles K. Rodgers,	Springfield, Ohio,	Mrs. Newton's
II. Robert Lincoln Scudder,	Princeton, N. J.,	Mr. Scudder's
II. George Silver,	Tarrytown, N. Y.,	49 U H
II. Edgar Maverick Smith,	New York City,	68 and 69 U H
I. Samuel Wood Thurber,	Syracuse, N. Y.,	85 S E H
I. James Ross Todd,	Louisville, Ky.,	34 U H
I. William Campbell Trusdell,	Newark, N. J.,	2 S R H
II. George Shreve Wilkins,	Mount Holly, N. J.,	8 N E H
I. Frank Scott Willock,	Allegheny City, Pa.,	32 U H

FRESHMEN, . . . . . 35.

#### SPECIAL STUDENTS.

I. Samuel Mills Bevin,	Easthampton, Conn.,	Mrs. Lavake's
I. Daniel Webster Evans, Jr.,	Englewood, N. J.,	1 E W H
I. Arthur Daniel Forst,	Trenton, N. J.,	15 N E H
II. Edward Heber McCleery,	Milton, Pa.,	20 S E
II. Gilbert N. McMillan,	Detroit, Mich.,	6 and 7 U H
II. George Thebaud Maxwell,	New York City,	2 E M W H
I. William Sampson C. Maxwell,	Brooklyn, N. Y.,	2 E M W H
I. Frank Seymour Miller,	Elmira, N. Y.,	Mrs. Fine's
II. Fred G. Moore,	Holton, Kan.,	Mrs. Warren's

I. Forster Wingate Weeks, Newark, N. J.,	9 E W H
II. Charles Stewart Wurts, Jr., Philadelphia,	Mrs. Ferguson's
II. Fred. A. Young, Princeton, N. J.,	Prof. Young's
SPECIALS, . . . . .	12.

SUMMARY.

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SENIORS, . . . . .	12
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CLASSIFICATION BY RESIDENCE.

NEW JERSEY.....	128	FLORIDA.....	2
PENNSYLVANIA.....	110	INDIANA.....	2
NEW YORK... ..	98	KANSAS.....	2
OHIO .....	26	MICHIGAN.....	2
DISTRICT OF COLUMBIA.....	19	ALABAMA .....	1
MARYLAND.....	11	DAKOTA.....	1
ILLINOIS.....	10	LOUISIANA .....	1
CALIFORNIA .....	5	NORTH CAROLINA.....	1
KENTUCKY.....	5	RHODE ISLAND.....	1
MA-SACHUSETTS .....	5	SOUTH CAROLINA.....	1
GEORGIA.....	4	TENNESSEE.....	1
IOWA.....	4	UTAH.....	1
MINNESOTA .....	4	VIRGINIA.....	1
MISSOURI .....	4	WISCONSIN .....	1
CONNECTICUT.....	3	WEST INDIES.....	1
DELAWARE.....	3	SCOTLAND .....	1
OREGON .....	3	EGYPT.....	2
COLORADO.....	2	INDIA.....	2

ABBREVIATIONS.

N. Nassau Hall.	E W H, East Entry of Witherspoon Hall.
N E, North Entry of East College.	W W H, West Entry of Witherspoon Hall.
S E, South Entry of East College.	E M W H, East Middle Entry of Witherspoon Hall.
N W, North Entry of West College.	W M W H, West Middle Entry of Witherspoon Hall.
S W, South Entry of West College.	N E H, North Entry of Edwards Hall.
N R H, North Entry of Reunion Hall.	S E H, South Entry of Edwards Hall.
S R H, South Entry of Reunion Hall.	U H, University Hall.
N M R H, North Middle Entry of Reunion Hall.	
S M R H, South Middle Entry of Reunion Hall.	

HONORS AND DEGREES CONFERRED.

DEGREES.

*Honorary Degrees Conferred June, 1886.*

- LL.D.—John C. Dalton, M.D., President of College of Physicians and Surgeons, New York.
- Ph.D.—Rev. Robert D. Wilson, Class of '76, Professor in Western Theological Seminary, Pennsylvania.
- A.M. —William P. Armstrong, Alabama.  
          Samuel M. Inman, Georgia.  
          Dr. W. H. Murray, New Jersey.  
          Rev. Naomi Tamura, Japan.

*Degrees in Course.*

- D.Sc. —Rev. John E. Peters, A.M., Class of '70.  
          Thesis, Histology of Cartilaginous Fishes.

Master of Arts, . . . . .	60
Bachelor of Arts,. . . . .	95
Master of Science, . . . . .	2
Bachelor of Science, . . . . .	8
Civil Engineer, . . . . .	

HONORS—1885-86.

COMMENCEMENT HONORS.

MASTER'S ORATION.

Andrew W. Wilson, Jr., Pennsylvania.

## SENIOR HONORMEN.

FIRST GROUP—*Magna cum laude.*

{ Matthew Corry Fleming,	<i>Latin Salutatory.</i>
{ George Black Roddy,	<i>English Salutatory.</i>
George A. Tryon Eddy,	<i>Valedictory.</i>
Ralph Crowley Sheldon,	<i>The Political Science Oration.</i>

SECOND GROUP—*Cum laude.*

With special excellence in particular departments indicated.

Joseph Devoe Baucus,	<i>American Constitutional Law.</i>
James Harrington Boyd,	<i>Mathematics.</i>
John Calhoun.	
Arnold Guyot Cameron,	<i>English Literature. Greek.</i>
John W. Cary, Jr.,	<i>American Political History.</i>
Harry Charles Elsing,	<i>Continental Literature.</i>
Charles Rosenbury Erdman,	<i>Philosophy.</i>
Fred Evans, Jr.,	<i>General Excellence.</i>
Walter Lowrie Hervey,	<i>Political Economy.</i>
John Cass Mathis,	<i>History.</i>
John William McKecknie.	
Edward Demoss Miller,	<i>Ethics.</i>
Marion Mills Miller,	<i>Belles Lettres.</i>
John Archer Silver,	<i>Modern Languages.</i>
Taylor Reed,	<i>Physics.</i>
Oliver Smith Strong,	<i>Metaphysics.</i>
John Milligen Waddell.	
Robert Parmelee Wilder,	<i>Mental Science.</i>
Wilson Farrand, entitled to a place on the Honor List, but not regularly examined on account of ill health.	
Anthony W. Durell, William Jessup and Francis F. Kane of the Third Group, also received Commencement orations.	

## FELLOWS.

(For names of Fellows see Page 14.)

## SENIOR PRIZEMEN.

## ALEXANDER GUTHRIE MCCOSH PRIZE.

George A. T. Eddy, New York.

## CLASS OF 1859 PRIZE IN ENGLISH LITERATURE.

Arnold Guyot Cameron, New Jersey.

## IN SCIENCE AND RELIGION.

Charles Helliwell, New Jersey.

## THE GEORGE POTTS BIBLE PRIZE.

John Archer Silver, Maryland.

Robert P. Wilder, New Jersey.

## THE LYMAN H. ATWATER PRIZE IN POLITICAL SCIENCE.

Francis F. Kane, Pennsylvania.

## LYNDE PRIZE DEBATE.

Wilson Farrand, N. J., *First Prize*.Richard M. Hodge, Conn., *Second Prize*.Henry W. Jessup, Pa., *Third Prize*.

## DEBATERS.

*American Whig Society.*

Joseph D. Baucus, N. Y.,

Richard M. Hodge, Conn.

Henry W. Jessup, Pa.

*Philosophic Society.*

William S. Elder, O.

Wilson Farrand, N. J.

John C. Mathis, Ill.

## BAIRD PRIZEMEN.

The Baird Prize.—George A. T. Eddy, New York.

In Oratory. Walter L. Hervey, Ohio.

Robert P. Wilder, New Jersey.

In Delivery. Marion M. Miller, Ohio.

In Poetry. Marion M. Miller, Ohio.

In Disputation. Anthony W. Durell, N. J., *First Prize*.Ralph C. Sheldon, N. Y., *Second Prize*.

*Competitors Appointed for Excellence in English Composition:*  
*For Baird Prize and Prize for Oratory*—A. G. Cameron, G. A. T. Eddy, W. S. Elder, C. R. Erdman, M. C. Fleming, F. F. Kane, M. M. Miller, G. B. Roddy, R. C. Sheldon, R. P. Wilder. *For Prize for Oratory*—J. D. Baucus, A. W. Durell, H. C. Elsing,

F. Evans, Jr., W. L. Hervey, H. L. Hodge, R. M. Hodge, W. H. Hudnut, H. W. Jessup, W. Jessup, A. S. Maper, J. C. Mathis, H. C. Meserole, S. Paton, T. Reed, J. A. Silver, O. S. Strong, J. M. Waddell.

### JUNIOR HONORMEN.

#### *First Group.*

R. B. C. Johnson, W. I.      F. E. Reid, O.  
C. W. Rouse, N. Y.

#### *Second Group.*

S. T. Dodd, N. Y.	James Paige, Minn.
S. S. Iszard, N. J.	J. W. Queen, Jr., N. J.
M. H. Liddell, Pa.	G. L. Robinson, N. Y.
Paul Matthews, D. C.	A. H. Scofield, N. J.
P. M. McQueen, Scotland.	F. H. Smith, Mich.

### JUNIOR HONORMAN, SCHOOL OF SCIENCE.

#### B. S. COURSE.

G. P. Jessup, N. Y.

### JUNIOR PRIZEMEN.

#### *Junior First Honor Scholar.*

R. B. C. Johnson, West Indies.

#### *Dickinson Prizeman.*

Francis Harding White, D. C.

#### *Maclean Prizeman.*

R. B. C. Johnson, West Indies.

#### *Junior Orator Medalists.*

R. W. Mason, O., *First Medal.*  
Frank H. Smith, Mich., *Second Medal.*  
Geo. L. Robinson, N. Y., *Third Medal.*  
Paul Matthews, D. C., *Fourth Medal.*

*Competing Junior Orators.**American Whig Society.*

Robert W. Mason, O.  
 Paul Matthews, D. C.  
 P. M. McQueen, Scot.  
 Frank H. Smith, Mich.

*Clisosophic Society.*

Geo. T. Berry, N. J.  
 R. B. C. Johnson, West Indies.  
 John W. Queen, Jr., N. J.  
 Geo. L. Robinson, N. Y.

**SOPHOMORE HONORMEN.***First Group.*

W. M. Daniels, O.,  
 H. T. Dobbins, Cal.,  
 E. M. Hopkins, N. Y.,  
 C. S. Smith, D. C.,

Deaver Coll. Inst., Dayton, O.  
 City Coll., Jas. Matthews, Prin.  
 Albany State Normal School.  
 Rittenhouse Acad., Wash., D. C.

*Second Group.*

E. T. Carter, N. J.,  
 Russell Carter, N. J.,  
 F. L. Drummond, N. J.,  
 Kemper Fullerton, D. C.,  
 W. M. Irvine, Pa.,  
 F. J. Knox, N. J.,  
 T. M. Parrott, O.,  
 R. E. Prime, Jr., N. Y.,  
 E. T. Richardson, Va.,  
 E. V. Richardson, N. J.,  
 Peter Rioseco, Pa.,

Sedgwick Inst., Great Barrington, Mass.  
 Montclair High School.  
 Newark Acad., Newark, N. J.  
 Erie Acad., Erie, Pa.  
 Phillips Exeter Academy.  
 Lawrenceville School.  
 Morris Acad., Morristown, N. J.  
 The Yale School, Yonkers, N. Y.  
 S.W.P. Univ., Clarksville, Tenn.  
 State Model School, Trenton.  
 Fewsmith's School, 1008 Chestnut St., Philadelphia.  
 Bedminster Classical School, Bedminster, N. J.  
 Fulton Acad., Fulton, N. Y.  
 Morris Acad., Morristown, N. J.

W. H. Runyon, N. J.,

F. A. Waterman, N. Y.,  
 W. W. White, N. J.,

**SOPHOMORE PRIZEMAN.***Class of 1861 Prize.*

Edwin M. Hopkins, N. Y.



**FRESHMAN PRIZE.***Freshman First Honor Prize.*

Fred. Neher, New York.

**FRESHMAN HONORMEN.***First Group.*

Fred. Neher, N. Y.,	Troy Acad., Troy, N. Y.
E. Y. Robbins, N. J.,	Peddie Inst., Hightstown, N. J.
R. E. Speer, Pa.,	Phillips Andover Academy.

*Second Group.*

R. O. Aulick, D. C.,	St. John's School, Sing Sing, N. Y.
David Bovaird, Jr., Pa.,	Geneseo State Normal School, Geneseo, N. Y.
J. M. Brooks, O.,	West High School, Cleveland, O.
G. H. Carter, N. Y.,	Huntington Union School, Hunt- ington, N. Y.
H. G. Drummond, N. J.,	Newark Academy.
J. C. Gray, D. C.,	Emerson Institute, Washington, D. C.
Thomas Hanlon, N. J.,	Pennington Seminary.
E. R. Hewitt, N. Y.,	Miss Torrey's School, 122 East 44th St., New York.
R. H. Life, N. Y.,	Lawrenceville School.
W. L. Merrill, N. Y.,	Lycée Condorcet, Paris, France.
L. S. Mudge, N. J.,	H. N. Van Dyke, and Princeton Preparatory School.
T. H. P. Sailer, Pa.,	West Phila. Academy.
J. F. Stebbins, N. Y.,	Geneva Class. and Union School, Geneva, N. Y.

**FRESHMAN HONORMEN, SCHOOL OF SCIENCE.**

II. C. J. Montgomery, Ga.,	University of Georgia.
II. W. D. Bratton, Md.,	Geo. A. Blake, Elkton, Md.

# ACADEMIC DEPARTMENT.

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## ADMISSION.

### ENTRANCE EXAMINATIONS.

All entering students on their arrival must report at the President's house and register. Examinations for admission will be written, with supplementary oral examinations as needed. The first examination will commence in Princeton, on Thursday, June 28rd, at 11 A. M., and will continue through the afternoon of Friday. The second will commence on Tuesday, September 18th, at 11 A. M., and continue through the afternoon of Wednesday. Applicants who have any conditions or other deficiencies from the June examination are required to remove them at this time. *Attendance is required at the beginning of the examination.*

Simultaneously with the June entrance examinations in Princeton, examinations will also be held in the following cities, viz.: Pittsburgh, Cincinnati, Louisville, Chicago, St. Louis, Omaha, Denver, San Francisco; and at preparatory schools and other cities when necessary. The precise places in which the examinations are to be held can be learned by application to the President. Due notice of these examinations will also be published in leading local newspapers for several weeks in advance.

Examinations at other times and places than those specified are inconvenient and often impracticable, and applicants for admission at other than the regular days are required to pay \$10 into the treasury.

### SUBJECTS.

Candidates for admission to the Freshman Class are examined in the following books and subjects. It is recommended that the candidates be prepared for examination on the requirements as specified; but equivalents will be accepted.

### English.

English Grammar—Whitney, or Reed and Kellogg (Higher Lessons); Modern Geography—Guyot's Grammar-School Geography; U. S. History—Anderson's or Johnston's.

The writing of a short essay is required as a part of the examination: the theme for the essay of 1887 will be based on the life of Franklin or of Scott.

The attention of preparatory schools is called to the need of a more thorough study of elementary English.

### Latin.

Latin Grammar: especially the inflections; the simple rules for composition and derivation of words; syntax of cases and verbs and structure of the sentence in general, with particular regard to relative and conditional sentences, indirect discourse and the subjunctive; so much prosody as relates to accent, quantity, versification in general, and dactylic hexameter. Cæsar (five books of the Commentaries); Sallust (Catiline or Jugurtha); Virgil (six books of *Æneid*); Cicero's Select Oration (six); Arnold's Latin Prose Composition (twelve chapters), or Jones' Exercises in Latin Prose; Geography of Ancient Italy.

### Greek.

Greek Grammar, including prosody; Xenophon (four books of the *Anabasis*), or Greek Reader (Goodwin's) 111 pages; Homer (the first two books of the *Iliad*, except the Catalogue of Ships); Greek Composition (Jones' Exercises in Greek Prose, or an equivalent—writing with the accents required); Geography of Ancient Greece and Asia Minor. Goodwin's Grammar is preferred. Special stress is laid upon a thorough knowledge of the noun and verb inflections. Candidates will do well to read an additional book of the *Iliad*, where this can be done without sacrifice of thoroughness in the formal requisitions. Some experience in giving written answers to set questions is advantageous.

The Continental pronunciation of the vowels and diphthongs is preferred in both Latin and Greek.

### Mathematics.

Arithmetic, including the Metric system. Algebra, through quadratic equations involving two unknown quantities—including radicals, and fractional and negative exponents; Geometry, the first and second books of Euclid, or an equivalent—that is, the propositions in other text-books relating to the straight line and rectilinear figures, not involving ratio and proportion.

### PRELIMINARY EXAMINATIONS.

At the examinations in June and September, candidates intending to enter the Freshman Class one year later are admitted, on request, to examination on a portion of the subjects required for entrance. Unless in exceptional cases, either two of the four general subjects, English, Mathematics, Latin, Greek, must be offered entire; or such parts of at least three subjects as are here prescribed, viz.: in *English*, Grammar and Geography; in *Mathematics*, Arithmetic, with the Metric system, and either Algebra, through simple equations of two unknown quantities, or the first and second books of Euclid; in *Latin*, the full amount in Cæsar and one other author, with Grammar; in *Greek*, three books of the Anabasis, with Grammar.

In both Latin and Greek Grammar the examination will be upon noun and verb inflections, syntax of nouns and the simpler rules for syntax of verbs. This examination will be partial only, to be completed the following year.

Applications for preliminary examinations should be made to the President, with a statement of the subjects and amount offered, at least two weeks previous to the examination.

### OTHER REQUIREMENTS.

Candidates for admission to the Sophomore Class who have not completed the studies of the Freshman year at another College, must first pass an examination on the studies required for admission to the Freshman class.

Candidates for admission to the Sophomore, Junior or Senior class, coming from another College, are examined only in the

studies of the year preceding that which they wish to enter, provided they present evidence that they have passed satisfactory examinations on the previous studies of our curriculum and entrance requirements, or their equivalents, excepting French, Anatomy, Botany and Zoölogy. Some knowledge of the studies just mentioned is desirable but is not required.

No person is admitted to the College as a candidate for the degree of Bachelor of Arts after the beginning of the first term of the Senior year.

All candidates for admission to any class, or as special students, must bring with them testimonials of moral character and attainments, preferably from their last instructors; and if the candidate has been a member of another College or University, he must produce a certificate from its President or Faculty that he is free from censure in that institution.

No candidate is admitted into the College without examination and a vote of the Faculty.

Immediately after the opening of the College the entering students meet according to announcement for the registration of their names and subscription to the following pledge, required by the Board of Trustees :

We, the undersigned, do individually for ourselves promise, without any mental reservation, that we will have no connection whatever with any secret society, nor be present at the meetings of any secret society in this or any other College so long as we are members of the College of New Jersey; it being understood that this promise has no reference to the American Whig and Cluosophic Societies. We also declare that we regard ourselves bound to keep this promise and on no account whatever to violate it.

### ADMISSION TO SPECIAL COURSES.

In exceptional cases, undergraduate students, not members of any one of the four regular classes nor candidates for a degree, are admitted to the privileges of the College, and allowed to take special courses, selected under the direction of the Faculty, in such a manner as to secure full and profitable employment of their time. Such special students undergo a preliminary examination sufficient to ascertain their preparation for the course proposed, and are subject to the same regulations and

discipline and to the same examinations in the studies pursued, as other undergraduates. On completing their course they receive certificates of proficiency. These special courses, however, are not offered to those who have failed in the regular course.

## UNDERGRADUATE COURSE OF STUDY.

The course for the degree of Bachelor of Arts extends through four academic years and embraces instruction in the three departments of Philosophy, Language and Literature, Mathematics and Natural Science.

It includes two classes of studies, the required and the elective. The required studies are regarded as fundamental and essential in a liberal education, and therefore are not left to the student's option. The elective studies, though important, are not all indispensable, and accordingly are left, within definite limits, to the student's choice. Attendance is obligatory upon all electives, when once chosen, as well as upon all required studies. In connection with some departments there are also optional courses, with voluntary attendance.

All the studies of Freshman and Sophomore years are required, and include History, Greek, Latin, Modern Languages, Rhetoric and English Language, Mathematics and Natural History.

From the opening of Junior year onward the student, by availing himself of the elective system, may to a certain extent shape his course with reference to his individual tastes and the profession which he has in view. About two-thirds of the schedule time this year is given to the required studies, which are Psychology and Logic, English Literature, Physics and Oratory. In addition to this, students are required to pursue three elective studies, to be selected from the following: Philosophy of History, Greek, Latin, Modern Languages (French and German), Anglo-Saxon, Mathematics, Physical Geography.

In Senior year the range of electives is wider, required studies occupying less than two-thirds of the time. The re-

quired studies are Science and Religion, Ethics, Jurisprudence and Political Economy, Astronomy, Chemistry, Geology, English (Essays) and Oratory. The Senior electives are offered in three groups to assist the choice of students who desire to concentrate their elective work in the Department of Philosophy, or of Literature, or of Science, but no student is required to restrict his choice to any group. The Seniors take either six or seven hours a week elective work, making their election from the following list : *In Philosophy*—History of Philosophy, Metaphysics, Science and Religion, Comparative Politics, International and Constitutional Law, Physiological Psychology, Pedagogics, Archæology and History of Art ; *In Literature*—English Literature, Greek, Latin, French, German, Sanskrit ; *In Science*—Mathematics, Practical Astronomy, Physics, Applied Chemistry, Laboratory Chemistry, Biology or Palæontology, Histology.

Students are required to choose their electives for the first term at the beginning of that term, and no changes will be allowed after the close of the third week, and none before that time, except for special reasons approved by the Faculty.

Students are required to hand in writing to the Registrar, on or before the first Monday in December, their choice of electives for the ensuing second and third terms, and no changes will be allowed after that date, except for special reasons approved by the Faculty.

No student whose rank in any department at the close of a year (or term) is in the Sixth Group\* shall have the privilege of electing that department in the succeeding year (or term) without special permission from the Faculty.

Optional courses, so ordered as not to conflict with the time allotted to the regular instruction of the course, are offered in connection with several departments, under such restrictions as may be prescribed by the Faculty. These courses are designed to benefit those who wish to extend their reading or study in certain branches ; they amplify the subjects taken up in the regular course, and in some cases conclude with a special examination upon which is based a certificate of proficiency.

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\*Vid., p. 91.

The Freshman Class recites in divisions constituted according to rank in order to proportion the work to individual ability; rapid progress can thus be made by those who have special aptitudes for certain studies.

In awarding the Bachelor's degree and assigning the final rank, the student's work for the whole four years is taken into account.

The following is a statement of the various courses of instruction in the three academic departments :

### DEPARTMENT OF PHILOSOPHY.

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Mrs. Robert L. Stuart, of New York, has recently given to the College one hundred and fifty-four thousand dollars, to maintain professorships in this department, embracing Ethics, Logic, Metaphysics, History of Philosophy and Psychology. She gives this in memory of her late husband, Mr. Robert L. Stuart, and of his brother, the late Mr. Alexander Stuart.

The professorships now established on this foundation are those of Psychology and History of Philosophy, Ethics, and Mental Science and Logic.

Besides the undergraduate courses given below, the Department also embraces the courses on Contemporary Philosophy, Plato, and other subjects mentioned in connection with the graduate courses.

#### Metaphysics.

##### THE PRESIDENT.

This is a two hour elective in the first term of the Senior year. Of each hour ten minutes are given to dictation and the rest of the time to an explanatory lecture. Metaphysics is defined as the science of first or fundamental truths. The tests of such truth are self-evidence, necessity and catholicity. They are presented under three aspects: perceptions, regulative principles



and generalized maxims. They are divided into intellectual and moral and are subdivided into primitive cognitions, primitive beliefs and primitive judgments. Throughout there are historical and critical notices of opinion. The relation of Metaphysics to Theology and the other sciences is fully discussed. Realism is defended as opposed to Idealism and Agnosticism.

### **Psychology.**

PROFESSOR ORMOND.

Psychology is a required study occupying two hours a week during the first half of Junior year. The subject is treated in two main divisions entitled the Cognitive and Motive Powers. For the first part, McCosh's Cognitive Powers is used as a text-book, accompanied with lectures and recitations. The Motive Powers are treated, for the present year, in lectures accompanied with recitations and references for collateral reading.

### **Physiological Psychology.**

PROFESSORS OSBORN AND SCOTT.

This is an elective course for the Seniors, consisting of twenty lectures and demonstrations, occupying two hours a week during the first term. It is designed to give a general knowledge of the anatomy and physiology of the nervous system especially in their relation to current German, French and English researches upon the localization of functions in the brain.

Professor Osborn opens the course with alternate lectures and demonstrations upon the general structure of the nervous system, including nerves and nerve cells, the sense organs, the brain and the principal motor and sensory nerve tracts in the brain and spinal cord. The demonstrations accompany a laboratory course of practical study and dissection of the brain and examination of microscopic preparations. Professor Scott continues the subject with lectures upon the physiology of the nervous system, including the general problems of the origin and transmission of nervous force and the functions of the peripheral

nerves, spinal cord and brain. The different theories of the localization of functions in the cerebral cortex are discussed. Experiments illustrating nerve action of different kinds accompany this portion of the course.

### **History of Philosophy.**

**PROFESSOR ORMOND.**

This is an elective in the second and third terms of Senior year, occupying two hours a week. The topics discussed are I. The Ancient Greek and Roman Philosophies including the Pre-Socratic Schools ; Socrates, Plato and Aristotle ; and the Academic, Peripatetic, Epicurean and Stoic Sects. Zeller's Greek Philosophy is used as a text book. II. Modern Philosophy from Bacon to the present time, embracing Bacon, Descartes, Spinoza, Locke, Leibnitz, Berkeley, Hume, Reid, Kant, Hamilton and others. Modern philosophy is taught exclusively by lecture accompanied with recitations and discussions.

### **Science and Religion.**

**PROFESSOR SHIELDS.**

The study of the Harmony of Science and Religion extends through the second and third terms of the Senior year, and includes both a required and an elective course. The required course embraces (1) the harmony of the physical sciences with natural theology ; the Divine Being and attributes as illustrated by astronomy, geology and anthropology ; (2) the harmony of the mental sciences with natural religion ; the doctrine of a future life, divine government and probation as reconcilable with physical, ethical and metaphysical theories ; (3) the harmony of science with revealed religion ; the miraculous, prophetic, historical, and philosophical evidences of Christianity, and its consistency with the whole system of the physical and psychical sciences.

The elective course embraces the study of the sciences as connected with revealed religion ; their history, classification and

methods; normal and existing relations of reason and revelation; emerging religious controversies in the different sciences, the problem of their adjustment, and the issuing philosophical system.

While the required course aims to present the essential Christian evidences as usually taught in Colleges, the elective course may also have the incidental effect of promoting that sound ultimate philosophy which results from the harmony of science and revelation and looks forward to the gradual purification and completion of human knowledge.

In the elective course the instruction is given entirely by lectures. In the required course Butler's Analogy is used as a text-book, with occasional lectures, and monthly reviews and extemporaneous essays take the place of a final examination.

### **Logic.**

**PROFESSOR ORMOND.**

Logic is required in the last half of Junior year. (1) Deductive Logic—comprising the laws of discursive thought as implied in notions, judgments and reasonings. The syllogism and other forms of reasoning will be discussed. Text-book, McCosh's Manual of Logic. Text-book instruction will be accompanied with lectures and practical exercises. (2) Inductive Logic—treating of the principles and laws of induction, the canons of investigation and kindred topics. Taught by lecture and practical exercises with references for collateral reading.

### **Ethics.**

**PROFESSOR PATTON.**

This is one of the required studies of the Senior year. Two hours a week are devoted to it during the first term and one hour during the second term. Instruction is given by lectures accompanied by the use of Calderwood's Handbook of Moral Philosophy as a text-book. The lectures deal with both Theoretical and Practical Ethics and embrace such topics as the foundation

of moral obligation, the will, conscience, the nature of virtue, and the moral law. Special attention is given to recent ethical discussions, and portions of representative ethical treatises are recommended for collateral reading.

### **Philosophy of History and Political Science.**

PROFESSOR SLOANE.

I. *Sophomore Class.* Two exercises a week throughout the first term, required. Outlines of Universal History. Freeman's General Sketch of History is used as a text-book. Lectures, narratives and discussions are introduced as occasion requires.

II. *Junior Class.* Two exercises a week throughout the year, elective. Lectures and recitations on transitional epochs of history, with special reference to the science of politics and the progress of civilization.

III. *Senior Class.* Two exercises a week throughout the first term, elective. Lectures and recitations on (1) The rise and growth of European Colonies in North America and the causes of the War of Independence; (2) Comparative Politics from the standpoint of American institutions.

IV. *Graduate Course.* One exercise a week throughout the first and second terms. Historical methods and historical systems.

### **Jurisprudence and Political Economy.**

PROFESSOR JOHNSTON.

I. **REQUIRED COURSE.** The Senior class has for two hours a week throughout the first and second terms a course in the Philosophy of Public Law, in its connection with the material interests of the State; and in Political Economy, covering the historical development of the science, in all its phases and schools. Instruction in both branches of the course is by lecture, but some chapters of Pollock's History of the Science of Politics are used as a text-book in Jurisprudence, and Walker's Political Economy will be used as a text-book in that branch.

**II. ELECTIVE COURSE.** The Senior class has for two hours a week throughout the second and third terms a course in International and Constitutional Law, covering the three following subdivisions : (1) International Law, from the Peace of Westphalia to the Treaty of Berlin ; text-book, Gallaudet's Manual of International Law ; (2) the Constitutional Law of the United States, by lecture, including also the provisions of the State systems, so far as they are necessary to explain the Federal system. (3) the Political History of the United States since 1787 ; text-book, Johnston's History of American Politics.

**III. GRADUATE COURSE IN COMMON LAW.** A course in the elements of the English Common Law is open to graduates in the second and third terms. The first and third books of Blackstone's Commentaries are used as a text-book.

**IV. OPTIONAL COURSES.** (1) **ROMAN LAW.** An optional course of lectures on Roman Law, with Morey's Outlines of Roman Law as a text-book, is given to the Senior class during the first term ; and Professor Packard continues and completes it by reading the Institutes of Justinian with the class during the second term. (2) **ADVANCED POLITICAL HISTORY.** During the third term an optional class of Seniors will read a volume of Von Holst's Constitutional History of the United States, with Professor Johnston.

### **Pedagogics.**

**PROFESSOR WEST.**

This is an elective course in the Senior year, and occupies two hours weekly in the first term. It consists of lectures supplemented by text-book instruction, and develops the subject in its historical, theoretical and practical relations. A thesis is also required at the end of the course.

### **SCHOOL OF ART.**

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**PROFESSORS PRIME, MARQUAND AND FROTHINGHAM.**

This department aims to establish a museum and to furnish instruction in the History of Art and Archæology. As the basis

of a museum the College now possesses the Sheldon Jackson ethnological collection, the Van Lennep collection of Greek terra cotta heads, the Maimon collection of Assyrian gems, examples of Mexican and Peruvian pottery, besides photographs, lantern slides and casts. Since the publication of the last catalogue, the Museum has acquired from the Metropolitan Museum, New York, a series of about two hundred Cypriote vases and specimens of ancient glass; from the British Museum, London, a representative series of electrotpe reproductions of Greek and Roman coins, impressions of ancient gems and selected casts of cameos; from Alaska were secured many objects of native industry and a few antiquities, and from the Japanese Village Company a series of cloisonné plaques showing the various stages of the process. New subscriptions for the Art School building have been received. As soon as the building is erected it will receive the Trumbull-Prime collection of pottery and porcelain.

I. Public Lectures. Dr. Waldstein, of Cambridge, England, will give a short course of lectures in January on Phidias and Michael Angelo.

#### II. Graduate Courses :

(1) President McCosh gives a few lectures on *Æsthetics* as illustrated by nature.

(2) Prof. Frothingham lectures once a week during the first term, on Babylonian and Assyrian Archæology.

(3) Prof. Marquand conducts a private class in Homeric Archæology.

#### III. Senior Elective :

(1) Prof. Frothingham, on the History of Christian Architecture; two exercises a week during the first term.

(2) Prof. Marquand, on the History of Greek Art; two exercises a week, second and third terms.

#### IV. Junior Optional :

Prof. Marquand lectures on Greek Mythology in Art, once a week during the first term.

N. B.—Prof. Prime will not lecture during the present year.

## DEPARTMENT OF LANGUAGE AND LITERATURE.

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### Greek.

PROFESSORS CAMERON, ORRIS, AND WINANS.

#### *Freshman Year.*

The Freshman Class is divided into four sections, each of which receives five hours of instruction in Greek every week during the first term, and four hours a week during the second and third.

**POETRY.**—Homer: The Iliad, Books XVI., XVIII., XXII.; Epic forms and syntax; prosody and scanning; the Homeric question; antiquities and mythology. Two exercises a week during the first and second terms, and one during the third, by Professor Cameron.

**PROSE.**—The Greek Historians: varied selections from Herodotus, Thucydides, and Xenophon, made with an aim to illustrate the best style of the author, and likewise, as far as practicable, to present thus from the original sources the history of the most interesting and important epochs,—the rise of the Persian Monarchy, the Persian Wars, Athens under Pericles, opening and closing scenes in the Peloponnesian War, the downfall of Athens. This is followed by a short course of outlines of Greek History, in English, intended to review and supplement the previous course and to furnish a comprehensive view of the whole subject. The class is trained in reading at sight, and with the advanced sections a considerable amount of Herodotus is thus read.

Xenophon's Symposium is read in the third term, with sight reading of sections from the *Oeconomicus*; accompanied also by talks on Greek domestic life.

Also, throughout the year, review of Greek Grammar, with elucidations; Goodwin's doctrine of the syntax of the verb; review of elementary Greek Prose Composition, with written exercises; followed by advanced Greek Prose (Sidgwick's).

Three exercises a week in first term, two in second term and three in third term, by Professor Winans.

NOTE.—As the authors and the amount read during the Freshman year may vary from year to year, the following is indicated as a *minimum* for applicants for Sophomore standing: Homer, books XVI., XVIII., XXII.; Greek Historians, 100 pages, selected at pleasure, one-half to be from Herodotus or Thucydides.

### *Sophomore Year.*

The Sophomore class is divided into two sections, each of which receives four hours of instruction in Greek every week during the first and second terms; three hours during the third.

GREEK ORATORY.—The Olynthiacs and Philippics of Demosthenes; Demosthenes and the political condition of Greece in his time. The Rhetoric of Aristotle, Book III., with analysis and comments; Greek Prose Composition on the basis of the text of Demosthenes, including analysis in Greek of the Olynthiacs and Philippics; dictations on Greek lexicology, stating and explaining the laws pertaining to the formation, derivation and definition of the words of the language. The first half of the class recites in two subdivisions, each subdivision four hours a week during the first term; the second half in two subdivisions, each four hours a week during the second term and three hours a week during third term, to Professor Orris.

POETRY.—Euripides: the Medea. The origin of tragedy; analysis of the Medea; life of Euripides. The second half of the class recites two hours a week during the first term, the first half two hours a week during the second term and three hours a week during the third term, to Professor Cameron.

PROSE.—Xenophon: the Memorabilia. A selection is made of the more interesting parts of the memoirs, especially of such as are important to subsequent philosophical study. While these parts are read carefully, it is found practicable to read most of what is left at sight. Such general subjects are treated as the life of Xenophon; review of his works; his relations to Socrates as pupil and biographer; review of the political history of the period; the Socratic system of ethics; the method and influence of Socrates as a teacher. Selections from Lucian; so-



ciety, religion and literature of the second century, A. D. The second half of the class recites two hours a week during the first term, and the first half two hours a week during the second term to Professor Winans.

*Junior Year.*

**ELECTIVE GREEK.**—Attic Tragedy: Æschylus—selected dramas. Lectures on the works of Æschylus, and on the origin, character and relations to modern literature of the Attic drama. Two hours a week for half the year. Professor Orris.

Aristophanes. Ordinarily one play is read critically, another more rapidly. The following are some of the collateral subjects treated by lecture, with references to various text-books: the Dionysus myth and worship; the development and history of comedy; a review of Aristophanes' extant works and the fragments; Aristophanes' literary criticisms, and his attitude toward the philosophical, social and political movements of his time; the presentation of comedies; the metres of comedy. Thucydides, Plutarch, Lucian, may be introduced either as a special course, or to furnish material for sight-reading. Two hours a week for half the year. Professor Winans.

**OPTIONAL.**—Lyric Poetry, or advanced Greek Prose Composition. Professor Orris.

*Senior Year.*

**ELECTIVE GREEK.**—In Senior year there are two independent elective courses, the first occupying two hours a week, second and third terms, and the second two hours a week, first term.

**TRAGEDY.**—Sophocles. The *Œdipus Tyrannus*. Criticism of the play, the plot, the significance of the tragedy. Description of the Greek theatre. Lectures on the physical geography of Greece as affecting the character and language of the people; the origin of the Greek alphabet; the characteristics of the Greek language; rise and character of Greek literature; epic poetry; lyric poetry; history; tragedy; comedy; oratory; philosophy; Greek antiquities; manners and customs; remains of cities and buildings. Professor Cameron.

**GREEK PHILOSOPHY.**—Plato; selected dialogues. Lectures on the philosophy of Plato; on Greek literature and philology; on the theories of the origin of language, and on the causes which underlie and determine dialectic varieties. Professor Orris.

**OPTIONAL.**—Theocritus, with a review of his relations to subsequent poetry. Professor Orris.

#### SCHOOL AT ATHENS.

This College, in connection with others, assisted in establishing and contributes to the support of the American School of Classical Studies at Athens. This school affords facilities for archæological and classical investigation and study in Greece, and approved graduates of this College are entitled to all its advantages free of tuition. Professor Sloane represents Princeton in its Managing Committee.

#### Latin.

PROFESSORS PACKARD AND WEST AND TUTOR WESTCOTT.

Instruction given in the Department of Latin Language and Literature and Science of Language involves,

*First*—The constant training of classes in the etymology and syntax of the language, and in the power to translate it accurately and fluently into idiomatic English.

*Second*—Instruction in Latin Prose Composition. The object here aimed at is not facility in writing Latin as a mere accomplishment, but rather the acquisition of power to translate at sight any ordinary Latin into fluent literary English, and also to think easily in the Latin order of thought.

In the Freshman year written exercises form the basis of instruction. These exercises are examined in order to leave no errors uncorrected. Practice in extemporaneous composition, both oral and written, is continually attempted, on as extensive a scale as the student's grammatical knowledge permits. Thematic composition, in its higher forms, is reserved for later optional study.

*Third*—The reading and interpretation of particular authors, whether literary or historical, or both combined. This implies, as collateral branches of study, the history of Roman literature and the archæology of Roman life, social and political. Roman history is studied in its three leading periods; first, in connection with portions of Livy's Histories, the early history down to the times of the Gracchi; second, in connection with Cicero's Letters, the period from the Gracchi to the Empire; and, third, in connection with Juvenal's Satires and Pliny's Letters, the earlier Empire, especially its moral and religious aspects in contrast with Christian truth and Christian life.

The exercises with the two lower classes are chiefly recitations, accompanied, or rather interspersed with constant communication of collateral illustrative instruction suggested by the text-book, calculated to quicken and broaden the interest of the student; with care, however, not to infringe upon the frequency and thoroughness of the recitations required of the student. Occasional lectures of a more formal character are introduced in the Sophomore year. These treat, in connection with Cicero's Letters, of the representative characters and historical scenes and topics there found; and in connection with Horace, the history of literature down to his time, his contemporaries, the introduction and influence of Greek, especially Alexandrian, literature at Rome, and his own characteristics as to topics, style, views of life, etc.

In reading Terence and Plautus, translation is desired as close to literary English as the comic style and sentiment will allow; and to this end the class is required to read large portions in review and at first sight in advance work. Practice is given in reading the comic metres in order to show their dramatic and linguistic value, especially as bearing upon the colloquial use of Latin. Among other topics investigated are the principles of language-change embodied in the metres, the literary obligations of Terence to Plautus, and of both to early Latin literature and the Greek comedians, the social life of Rome in the second century B. C., and the relations of ancient to modern comedy.

In the Junior year lectures are more frequent ; in connection with Juvenal and Pliny, treating of the other sources of our more intimate knowledge of the social and moral condition of the Empire in Italy and the Provinces ; and, in connection with such of Cicero's rhetorical, ethical, or religious treatises as are read, treating of literary life and training at Rome, the sources and character of Roman philosophy and the religion of Rome. In the Senior year lectures occupy about one-third of the time, being in part illustrative of Lucretius, but chiefly upon the science of language, its general principles, physiology of speech, phonetic laws, formation of words, history of inflections, comparative laws of syntax.

The authors used in the order of the curriculum are Livy ; Horace's Odes ; Selected Letters of Cicero ; Terence ; Tacitus ; Horace's Satires and Epistles ; Catullus ; Juvenal's Satires ; Selected Letters of Pliny ; Suetonius ; Plautus ; Cicero's Treatises (De Oratore, De Natura Deorum, De Fato, etc., varying from year to year) ; Lucretius, De Rerum Natura ; Bruns, Fontes Juris Romanæ, with use of Corpus Inscriptionum Latinarum, and Ritschl, Priscæ Latinitatis Monumenta, Justiniani Institutiones ; Selections from Seneca's Moral Epistles ; also from Tertullian and St. Augustine.

The instructors suggest questions for special investigation, and designate volumes and parts of volumes, illustrative of the author or period under study, to be read in private by the class during the term, upon which questions are put in examination papers eliciting extended written answers.

On two evenings of each week such students as wish, meet with Professor Packard for the study of some Latin work collateral with the class-room exercises. The sources of Roman law constitutes the graduate course for the present year.

### English Literature.

PROFESSOR MURRAY.

The study of English Literature is pursued during the Junior year, and through the first term of the Senior. It includes both a required and an elective course.

*Junior Year.*

The required course extends through the year, occupying two hours a week. In the first term special attention is given to the study of Chaucer, in order to gain some knowledge of the English language at that stage of its development; mainly, however, for the sake of his poetry. In addition to lectures, some of Chaucer's poems are read in the class-room. After Chaucer, Spenser and the English Drama before Shakespeare are the subjects of study.

In the second and third terms lectures are given on Elizabethan dramatists and on Bacon, Milton, and Dryden. Milton's great epic is studied at some length. The great writers of the Queen Anne Period are also discussed. The required course ends with the study of the Literary Restoration. Cowper, Burns, Wordsworth, Byron, Shelley, Sir Walter Scott are the authors brought under review. Should time permit, some representative authors of the Victorian Period will also be noticed.

During the third term a play of Shakespeare is studied in the class-room, with reference to a further study of Shakespeare in the Senior year.

*Senior Year.*

The elective course, to which two hours a week through the first term are assigned, is mainly devoted to critical study of Shakespeare's plays. The choice of these varies from year to year. Those to be read this year are Othello, the Winter's Tale and Richard III.

In addition to this study of Shakespeare, lectures on folk lore and comparative literature will be given this year in this course.

An optional class is formed during the second term, for reading authors not treated in the class room. Essays also are required from both the Junior and Senior classes.

**English Language and Discourse.**

PROFESSOR HUNT.

*Freshman Year.*

The elements of Discourse are studied as embraced in the following subjects: theme, choice of material, diction and

structure, style. The study of English words, as given in Trench, (*Study of Words, Select Glossary,*) is also pursued. Essay writing is an essential part of the course, and is continued through the year. Lectures on English Vocabulary.

*Sophomore Year.*

The study of Discourse—its principles, processes, qualities and forms—is pursued. Also, the historical study of the English language. Essays are required throughout the year.

*Junior Year.*

The study of Anglo-Saxon as an elective branch is begun. On the basis of March's text-books, the student is drilled in the forms and principles of grammar and taught to read with ease the best prose and poetry of First English. In connection with this grammatical and textual study, instruction is given by lecture on a large variety of subjects—philological and historical—rightfully included in such a course. The students are also encouraged to private reading on any of the topics presented in the class-room. *Beowulf* and *Caedmon* are read as an advanced course.

**Oratory and Aesthetic Criticism.**

PROFESSOR RAYMOND.

*Freshman Year.*

First term, weekly lectures and drill in elocution, explaining the meanings and teaching the methods of gesture and vocal emphasis, with readings and declamations required from all the class. Text-book, Raymond's *Orator's Manual*.

*Sophomore Year.*

Exercises according to degrees of proficiency. Two private rehearsals of declamation and one written oration required from all, supplemented by a voluntary course in vocal culture.

*Junior and Senior Years.*

Oratorical delivery and composition, and the analysis and illustration of themes. In Junior year one written oration and

two rehearsals in delivery are required from all ; in Senior year two written orations, two rehearsals, and public speaking before the College, in which there are contests for various prizes in oratory, poetry, and disputation. (See heading "Prizes and Competitive Scholarships.") Besides this, between fifteen and twenty of the best writers and speakers among the highest honormen deliver orations at Commencement. There is an endeavor to adapt the course, as continued through these two years, to the individual needs of students ; and opportunities are afforded for voluntary work, together with training, thorough and complete, in vocal culture, and instruction in the principles of æsthetic criticism, as applied to elocution and rhetoric and to poetry and the other arts.

### **Exercises in English Composition.**

These are examined and corrected by the professors of English literature, rhetoric and oratory, and in Junior year by professors in special departments of philosophy, politics and science. The requirements are : Freshman year, five or six essays ; Sophomore year, five or six essays and one oration ; Junior year, five essays and one oration ; Senior year, two essays and two orations. In every year of the course several prizes or honorary appointments are given for excellence in essay writing and in public address, either by the College, or by the Clisophic or American Whig Societies, acting through committees appointed from their own members in the Faculty. (See heading "Fellowships, Prizes, Scholarships.")

### **Modern Languages.**

**PROFESSOR KARGÉ AND MR. BALDWIN.**

This course comprises the study of the French and German languages. The former begins as a required study in second term Freshman year and continues through the Sophomore year, twice weekly. Recitations are conducted in divisions averaging twenty-five students each. For a better apprehension of the thought as well as for greater facility in the use of the language,

oral and written recitations alternate. Essential rules pertaining to grammar-forms, pronunciation, paradigms of regular and of irregular verbs, translation from English into French, reading and analysis, constitute the course of instruction in the Freshman year.

### *Sophomore Year.*

Review of the course of the preceding year, with a more comprehensive treatment of the verb as regards the use of tenses, moods and participles; this in addition to a study of the essential principles which characterise the origin and development of the language, constitutes the first term's instruction. Half of the second term is spent in reading George Sands' *La Mare au Diable*, in which idiomatic expressions and delicate shades of modern French construction are carefully noted. For a better comprehension and appreciation of the study of French Literature, the remainder of the year is taken up with reading Lacombe's *Petite Histoire du Peuple Française*. As introductory to the classical writers, selections from Corneille's *Cid*, Racine's *Athalie* and Moliere's *Le Bourgeois Gentilhomme* are critically read and interpreted. At the close of the Sophomore year, students are required to pass a final oral and written examination in descriptive grammar and in the history of the language; moreover, to render at sight into fluent English any given author, whether in prose or poetry.

### *Junior Year.*

Such students as have acquired during the preceding two years sufficient knowledge can, if so inclined, pursue an independent course of study in French, while an opportunity is offered them to take up German twice weekly as an elective for the remainder of their college course. As the difficulties in pronouncing German are in no way to be compared with those met with by the student in French, reading, grammar-forms and translation into English are simultaneously taken up, and when a fair knowledge of the verb and its construction is attained, easy and interesting German prose is read, whereby the students are encouraged to form and answer questions in the vernacular.



Towards the middle of the second term, Goethe's *Hermann und Dorothea* is taken up, the German itself being used, as far as time permits, in conducting the recitations.

### *Senior Year.*

Besides the reading of Lessing's *Nathan der Weise*, Minna von Barnhelm and Schiller's *Jungfrau von Orleans*, a portion of each hour is devoted to lecture, in which the literary history of leading European nations, from the Italian Renaissance to the Unification of Germany, is expounded.

Provision will shortly be made for instruction in the Italian and Spanish languages.

### **Sanskrit.**

PROFESSOR WINANS.

Sanskrit is a two hour elective in Senior year. Students are requested to advise with the professor before electing it. In the grammatical study special attention is paid to the bearing of the language on Philology and Comparative Grammar. The various phenomena of the language, its sounds, roots, forms, inflections, are considered with some detail in relation to those of other Aryan tongues. The following is an outline of the early stages of the course: Sanskrit Primer (Perry), a series of graded lessons on the plan of Greek and Latin first-lessons; reading of several books of the *Nalopâkhânam*, an episode in the great Hindoo epic, the *Mahâbhârata*, with review of Sanskrit Grammar (Whitney's); then, selections from the *Hitôpadeça*.

## **DEPARTMENT OF MATHEMATICS AND NATURAL SCIENCE.**

### **Mathematics.**

PROFESSORS DUFFIELD AND FINE AND TUTOR CARMAN.

In the Freshman year there are two exercises a week during the first and second terms, in Algebra, and two exercises a week

during the third term, in Plane Trigonometry, under Professor Fine ; in Geometry there are two exercises a week throughout the year, under Tutor Carman. The text-book in Algebra for the present year is Wells' University Algebra, to be supplemented by a course on the Theory of Equations, by the professor. Newcomb's Trigonometry is the text-book in Trigonometry. Euclid is used as the text-book in Geometry because of its historical associations and its decided superiority for the purpose of mental discipline to any modern text-book. The first six and the eleventh books of Euclid are supplemented by a course in Solid and Spherical Geometry. Since a thorough knowledge of Geometry and familiarity with its more important propositions can be obtained only by extended practice in the demonstration of theorems and problems not contained in the text-book, this exercise occupies a prominent place in our course of instruction.

The Sophomore class has three exercises a week throughout the year in Mathematics, under Professor Duffield. For the first term the studies are Analytical Trigonometry, Mensuration and Navigation ; for the second and third terms, Surveying, Spherical Trigonometry, Analytical Geometry and the elements of the Differential Calculus.

In the Junior year Mathematics is an elective study. The class has two exercises a week throughout the year, under Professor Duffield. For the first and second terms the studies are Analytical Geometry and the Differential Calculus ; for the third term, the Integral Calculus. During the Sophomore and Junior years Loomis' text-books are used—supplemented largely by oral instruction, and numerous exercises in addition to the examples for practice of the text-books.

The Senior class in Mathematics (elective) has two exercises a week throughout the year, under Professor Fine. The course for the current year is Analytical Geometry of Three Dimensions, Differential and Integral Calculus. Williamson's text-books on the Calculus are used, supplemented, however, by lectures on determinants, differentiation and integration of functions of the complex variable, definite integrals.

A characteristic feature of our method of teaching Mathematics is the prominence given to oral instruction. Throughout

the course, lectures on the history as well as on the principles of the different branches of study are given by the instructors.

### **Astronomy.**

**PROFESSORS YOUNG AND McNEILL.**

#### *General Course—Required.*

The course occupies three hours weekly during the first half of the year. There are two examinations, one just before the Thanksgiving recess, and one at the close of the course.

In the first half of the course the principal subjects treated are astronomical instruments, the methods of finding time, latitude and longitude, the earth in its astronomical relations, and the moon. In the second part, the sun, the planetary system and the stars are discussed.

The aim of the course is to impart a knowledge of the most important facts of the science, with an understanding of its principles, but the higher mathematics of the subject are not attempted. The class have frequent opportunities for examining the most interesting objects with the telescope.

#### *Practical Astronomy—Elective.*

One exercise weekly during Senior year. Text-book, Loomis' Practical Astronomy. The exercises consist of lectures upon the various instruments and their uses, with recitations from the text-book, and the discussion of the observations made by the class.

When the weather permits, each member of the class is required to spend from two to six hours weekly in making and reducing observations. The principal subjects embraced in the course are the following :

##### **I. SEXTANT AND REFLECTING CIRCLE.**

- (a) Adjustment and errors.
- (b) Determination of local time by altitudes of the sun (or stars).
- (c) Latitude by circum-meridian altitudes of the sun.

(d) Latitude by altitude of the pole star and a corresponding southern star.

(e) *Determination of the eccentricity and graduation errors of the instrument.*

## II. TRANSIT INSTRUMENT.

(a) Theory of errors and adjustment.

(b) Determination of local time by star observations, the azimuth correction being determined by a pair of circumpolars.

(c) *Reduction of a complete set of time observations by the method of least squares.*

## III. THE ZENITH TELESCOPE.

(a) Determination of latitude from star observations, the instrumental constants being independently determined.

(b) *Determination of latitude, together with the instrumental constants, by observations reduced by the method of least squares.*

## IV. PRIME VERTICAL INSTRUMENT.

Determination of latitude and instrumental constants by star observations.

## V. ASTRONOMICAL THEODOLITE.

(a) Azimuth by observations of the pole star.

(b) *Latitude and time by Gauss' "three star method."*

## VI. MERIDIAN CIRCLE.

(a) Determination of instrumental constants.

(b) Determination of star places (right ascension and declination), including the reduction of apparent place to mean.

(c) *Investigation of errors of graduation and periodic errors of micrometer screw.*

## VII. EQUATORIAL.

(a) Adjustment of the instrument.

(b) Determination of the place of a comet or minor planet by the ring or square micrometer.

(c) Study of the spectra of sun spots and solar prominences.

(d) *Measurement of double stars with the wire micrometer.*

## VIII. MISCELLANEOUS.

(a) Value of level divisions determined with the "level-trier."

(b) Determination of personal equation with Eastman's personal equation machine.

(c) *Form and size of transit instrument pivots determined with pivot spherometer.*

NOTE.—The italics denote problems regarded as supplementary. For want of time they are not generally all taken by any one member of the class, but are distributed according to circumstances.

## Physics.

PROFESSORS BRACKETT AND MAGIE.

### *Junior Year.*

REQUIRED COURSE.—This course is conducted by means of recitations and lectures. Anthony and Brackett's Elementary Physics is used as a text-book. The subjects treated are :

First term—Elementary Mechanics ; General Properties of Bodies ; Hydrodynamics ; Pneumatics ; Heat and Thermodynamics.

Second term—Magnetism ; Electrostatics ; Electrodynamics.

Third term—Acoustics ; Optics.

The valuable and well selected apparatus with which the department is supplied is constantly employed to illustrate and enforce the principles discussed.

Four hours a week during the first term, and three hours a week during the second and third terms, are allotted to this course.

### *Senior Year.*

ELECTIVE COURSES.—These courses, in general, involve practical work in the Physical Laboratory. They afford opportunity for the extended study of special topics.

The students pursuing the laboratory courses are referred to Kohlrausch's Physical Measurements and to the special manuals and memoirs accessible in the Library of the College. In addition, recitations upon Cumming's Theory of Electricity are required from all members of the laboratory class.

The following are among the problems ordinarily assigned : determinations of the intensity of the force of gravity at Princeton, by the method of Kater and by that of Borda ; determina-

tion of the modulus of elasticity for different metals; determination of the magnetic declination and of the horizontal component of the earth's magnetism, by means of the magnetometer; determination of the magnetic dip and of the total magnetic force by means of the dip circle; measurement of the electro-motive force of various elements in absolute units by means of the absolute electrometer and by means of the quadrant electrometer; measurement of electric currents by means of the voltameter; verification of Faraday's laws of electrolysis; determination of the efficiency of the dynamo-machine; measurement of the work expended in maintaining an incandescent lamp in action, (1) by means of the electric relations of the circuit, (2) by means of the calorimeter; determination of index of refraction by several methods; verification of Fresnel's researches in diffraction, with discussion; measurement of wave lengths of light by simple diffraction methods and by means of the spectrometer; examination of the phenomena and laws connected with polarized light; determination of specific heats by various calorimetric methods; investigation of radiant heat by means of Melloni's apparatus.

Those electing these courses are expected to devote at least two hours a week to laboratory work. At the close of the year each student is required to present a thesis discussing some problem previously assigned.

A course in mathematical physics is also offered, intended to prepare those electing it for advanced work in physics. The course this year will treat of analytical mechanics and the theory of heat.

## Chemistry.

PROFESSOR SCHANCK.

Students in the Academic Department attend a required course in general chemistry throughout the entire Senior year, and an elective course in applied chemistry during the second and third terms.

The course of instruction in general chemistry occupies two hours in the class-room each week, and in this course the at-

tempt is made to give quite fully the leading principles and facts of general chemistry, enforced by carefully prepared experimental illustrations. Besides these table illustrations, free use is made of lantern projections. The advantage of taking notes and of reading, in connection with the lectures, such works as Roscoe's, Remsen's, Richter's, Wurtz's, Miller's and Roscoe and Schorlemmer's, is appreciated and urged upon the class.

The additional parallel and elective course, embracing the leading applications of chemistry in the arts of life, also illustrated fully, occupies one hour each week second and third terms.

### **Laboratory Chemistry.**

**PROFESSOR CORNWALL AND DR. McCAY.**

This branch of chemistry constitutes an elective study during the first term of the Senior year. The course includes lectures by Professor Cornwall, with occasional recitations, and also work in the Laboratory under Dr. McCay. Qualitative chemical analysis is first taken up, the students learning to detect single bases and acids, acquiring thereby sufficient training to pursue further the study of qualitative analysis without supervision, should they desire to do so. At the same time they are required to explain fully, by chemical formulas and written explanations, all of the reactions involved in making the tests.

During the latter part of the term, experiments illustrating principles of general chemistry and chemical physics are first performed by the students, after which the most important classes of organic compounds are studied, and finally a few special examinations are made, such as: analysis of potable waters; examinations of milk; study of the general properties of the alkaloids, with a few characteristic tests; properties of disinfectants, etc. The object of the course is to train the student, as far as possible, in chemical manipulation, by means of experiments which shall both illustrate chemical principles and furnish practical knowledge likely to be of use in any subsequent professional or scientific study.

The course requires five or six hours a week ; three or four hours being generally devoted to laboratory work, and two hours to lectures and recitations.

### **Geology and Palæontology.**

PROFESSORS SCOTT AND OSBORN.

I. GEOLOGY.—The course in geology, conducted by Professor Scott, occupies three hours a week through the last half of the Senior year. The subjects treated are : (1) dynamical geology ; (2) structural geology, including lithology and petrography ; and (3) historical geology and palæontology. The text-book used is Le Conte's Elements of Geology (revised edition).

II. PALÆONTOLOGY.—The course in palæontology is one of the elective studies of the Senior class, and occupies about three hours a week throughout the year, including one lecture and two hours of laboratory work a week. The course of lectures, under Professor Scott, is devoted chiefly to the subject of vertebrate palæontology and anatomy. Two hours a week are given to the laboratory work under the direction of Professors Osborn and Scott. This is a parallel course of anatomical study, with dissection of the fishes, reptiles, birds and mammals which represent living groups and throw most light upon the structure and development of the fossil vertebrates as described in Professor Scott's lectures. The dissections are accompanied by demonstrations and drawings. Practical work is also carried on in the zoölogical and geological museums, and includes a series of museum demonstrations with explanations and comments upon the specimens in various collections. At the close of the course, a short original thesis on one of the fossil vertebrates in the E. M. Museum is required of each student, and takes the place of the lectures and practical work of third term. The text-books employed are Huxley's Anatomy of the Vertebrates, Parker's Zoötomy and Wiedersheim's Comparative Anatomy (Parker).

For advanced students there are especial facilities for study in the large number of undescribed fossil vertebrates collected



in the West by the scientific expeditions sent out by the College in 1877, 1878, 1882, 1885 and 1886.

## **Physical Geography.**

**PROFESSOR LIBBEY.**

This course occupies two hours each week throughout the second and third terms of Junior year, as an elective study. It consists of the study of the earth in the age of man, comprising two parts :

**A. THE GEOGRAPHY OF NATURE, or physical geography proper.**

1. The earth in the solar system ; astronomical geography, especially with reference to climatology.

2. The earth as a whole, or physics of the globe ; its form, dimensions, density and weight ; its proper temperature, volcanoes and earthquakes ; its magnetism.

3. The surface of the earth.

a. The lands, their arrangements ; morphology of the continents ; laws of relief.

b. The waters and their movements ; inland waters and continental drainage ; oceanography ; tides and marine currents :—the facts and their causes.

c. The atmosphere ; climatology ; laws of distribution of temperature ; winds and rains ; snow, ice and glaciers.

4. Laws of the distribution of plant and animal life.

**B. GEOGRAPHY OF MAN, or the relations of physical geography to the history of mankind ; human races, characteristics and law of distribution, contrasted with the distribution of life in nature ; the historic races and their functions in history. The continents as instruments for the development of human societies. The continents of Nature : Africa, South America, Australia. The continents of History : Asia, Europe, North America. Their special functions in the progressive development of mankind.**

Lectures and recitations, with oral and written examinations. Text-books:—Physical Geography, Guyot ; Earth and Man, Guyot. Both courses are abundantly illustrated by maps

and diagrams; and an optional course of lectures is given in which the lantern is used to illustrate the phenomena treated of in the regular course by means of a series of views from nature, numbering upwards of four thousand.

### **Zoology and Botany.**

**PROFESSORS SCHANCK AND MACLOSKIE AND MR. PHILLIPS.**

The required studies in these branches are included in a course which occupies one hour a week of the first and second terms, and two hours a week of the third term of the Sophomore year. Professor Schanck opens the course with a series of lectures, illustrated by models and diagrams, upon human anatomy and physiology. Professor Macloskie resumes the work during the second term in a series of lectures on elementary zoölogy. In the third term Professor Macloskie conducts a series of recitations in botany, accompanied by practical work in the examination of plants. In the Senior year, students may elect either biology or palæontology. The latter is conducted by Professor Scott, with practical biological work under Professor Osborn. (See course in Geology).

### **Biology.**

**PROFESSORS MACLOSKIE, OSBORN, SCOTT, AND MR. PHILLIPS.**

The elective course in biology is conducted by Professor Macloskie with the coöperation of Professor Osborn. This course occupies one required and three optional hours a week, and the subjects are divided as follows: (1) Structural botany and the invertebrate animals, under Professor Macloskie, including the structure and physiology of the principal plant-types and types of invertebrates; among the latter are such forms as the amoeba, the lobster, the locust, the fresh-water mussel, and the ascidians. The laboratory work connected with this study includes dissection and the use of the microscope upon typical plant and animal forms. (2) The second part of the course, under Professor Osborn, opens in February, and consists of ten lectures upon the general anatomy of the vertebrates, upon the

influences of natural environment, and upon the history of the theory of development of living types. The practical work is upon embryology and covers a microscopic study of the early development of the chick, following the course laid out in Foster and Balfour's Elements of Embryology, and obtaining embryos by the aid of an incubator.

During the second term an optional course of lectures on the embryology of the vertebrates will be given by Professor Scott.

### **Histology.**

**PROFESSOR LIBBEY.**

This study is an elective, occupying one afternoon each week during the second and third terms of Senior year, and consists of lectures and recitations upon normal histology. Only the normal tissues are discussed, and as wide a range of comparative study of the tissues in the animal kingdom is made as the time allotted permits. Especial attention is devoted to injecting, hardening, preserving, staining and mounting specimens, and students are carefully drilled in section cutting and in the use of the microscope, every facility being placed in their hands to enable them to do good work.

The lecture occurs on Wednesday afternoon of each week at 3 o'clock, but the laboratory is open at all hours to its regular students for private investigation, and the Instructor or the Biological Fellow will be present every afternoon to give assistance to those who may be present. A fee of \$10 is charged to cover mounting material, slides, etc.

Text books recommended:—Klein, Prudden, Shakespeare-Allen, Stirling, Striker.

## **SYNOPSIS OF COURSE.**

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### **FRESHMAN YEAR.**

#### *First Term.*

**LATIN**—Livy, (Book I). Roman History (Leighton's History of Rome). Latin Prose Composition. **GREEK**—Homer's Iliad,

(Book XVI). Selections from Herodotus, Thucydides, Xenophon. Greek Grammar. Greek Prose Composition. MATHEMATICS—Algebra (Wells'). Geometry (Todhunter's Euclid). ENGLISH—Elementary Discourse (Diction and Sentences). English Language. Trench's Study of Words. Trench's Select Glossary. Lounsbury's English Language, pp. 1-90. Lectures on Discourse and English Language. Essays. ORATORY—Lectures, and Drill in Elocution.

*Second and Third Terms.*

LATIN—Livy, (Books XXI, XXII). Roman History (Leighton's History of Rome). Cicero: De Senectute, De Amicitia. Horace: Odes. Latin Prose Composition. GREEK—Homer's Iliad (Books XVIII, XXII), Herodotus, Thucydides, Xenophon, selections. Outlines of Greek History. Greek Prose Composition (Sidgwick's). MATHEMATICS—Algebra (Wells'). Geometry (Todhunter's Euclid). Solid and Spherical Geometry. Plane Trigonometry (Newcomb's). ENGLISH—Essays. FRENCH—Grammar, with oral and written exercises.

SOPHOMORE YEAR.

*First Term.*

LATIN—Selected Letters of Cicero. Roman History from the Gracchi to Augustus. Terence: Andria. Tacitus: Agricola. GREEK—Demosthenes: the Olynthiacs and Philippica. Rhetoric of Aristotle, selections. Word-Formation. Laws of Phonetic change. Greek Composition. Euripides: The Medea. Xenophon's Memorabilia. MATHEMATICS—Analytical Trigonometry, Mensuration and Navigation. ENGLISH—Essays. FRENCH—Grammar completed. HUMAN ANATOMY AND PHYSIOLOGY. HISTORY—Freeman's General Sketch. ORATORY—Elocution. Declamation. Written Orations.

*Second and Third Terms.*

LATIN—Horace: Selected Satires and Epistles. Terence: Hautontimorumenos. Catullus. Tacitus: Agricola or Histories. GREEK—Demosthenes: the Olynthiacs and Philippica.

Rhetoric of Aristotle, selections. Word-Formation. Laws of Phonetic Change. Greek Composition. Euripides : The Medea. Xenophon's Memorabilia. Dialogues of Lucian (Williams' Selections). MATHEMATICS—Surveying. Spherical Trigonometry. Analytical Geometry. Elements of the Differential Calculus. ENGLISH—Advanced Discourse. Principles of Discourse (Hunt), or equivalent. English Language. Marsh's Origin and History of the English Language and Lectures on English Language, or equivalent. Lectures on English Language and Style. Essays. FRENCH—Syntax. Selections from George Sand, Lacombe, Corneille, Racine, Molière. ZOÖLOGY AND BOTANY. ORATORY—Elocution. Declamations. Written Orations.

### JUNIOR YEAR.

#### *First Term.*

#### REQUIRED STUDIES.

PSYCHOLOGY—McCosh's Psychology and Intuitions of the Mind. ENGLISH LITERATURE—Chaucer. Lectures. Essays. PHYSICS.

#### ELECTIVE STUDIES.

*In Philosophy*—PHILOSOPHY of HISTORY.

*In Literature*—LATIN—Cicero : De Natura Deorum and De Fato. GREEK—Æschylus : Selected Dramas. Lectures on the Attic Drama. GERMAN—Grammar. Oral and written translations from English into German. Whitney's German Reader. ANGLO-SAXON—March's Anglo-Saxon Grammar and Reader. Caedmon's Exodus and Daniel (Hunt). Beowulf (Harrison). Lectures on First English.

*In Science*—MATHEMATICS—Analytical Geometry.

#### *Second and Third Terms.*

#### REQUIRED STUDIES.

PSYCHOLOGY—(Concluded). LOGIC—McCosh's Manual. ENGLISH LITERATURE—Lectures. Essays. PHYSICS. ORATORY—Criticism. Written Orations. Delivery.

## ELECTIVE STUDIES.

*In Philosophy*—PHILOSOPHY OF HISTORY.

*In Literature*—LATIN—Juvenal, with History of the Empire. Selected Letters of Pliny. Suetonius. Plautus: *Moscellaria*. GREEK—Aristophanes: *Frogs*, *Clouds*. Lectures. FRENCH—Syntax. Racine's *Athalie*. Corneille's *Cid*. GERMAN—Grammar and Prose Composition. Goethe: *Hermann und Dorothea*.

*In Science*—MATHEMATICS—Differential and Integral Calculus. PHYSICAL GEOGRAPHY.

## SENIOR YEAR.

*First Term.*

## REQUIRED STUDIES.

ETHICS—Calderwood's *Moral Science*. Lectures. JURISPRUDENCE AND POLITICAL ECONOMY—Lectures. ENGLISH—Essays. ASTRONOMY—Newcomb and Holden's. Lectures. CHEMISTRY—Lectures. ORATORY—Criticism. Written Oration. Public Address.

## ELECTIVE STUDIES.

*In Philosophy*—METAPHYSICS. PHYSIOLOGICAL PSYCHOLOGY. COMPARATIVE POLITICS. PEDAGOGICS. ARCHÆOLOGY.

*In Literature*—ENGLISH LITERATURE—Shakespeare. GREEK—Sophocles. *Œdipus Tyrannus*. Aristotle's *Ars Poetica*. Plato: Selected Dialogues. Greek Literature and Philology. GERMAN—Lessing: *Nathan der Weise*, *Minna von Barnhelm*. Schiller: *Jungfrau von Orleans*. Lectures. SANSKRIT—Perry's *Primer*.

*In Science*—MATHEMATICS. ASTRONOMY—Practical. PHYSICS—Practical course in the Laboratory, or Mathematical Physics. LABORATORY CHEMISTRY. BIOLOGY or PALÆONTOLOGY.

*Second and Third Terms.*

## REQUIRED STUDIES.

ETHICS (concluded). SCIENCE AND RELIGION—Lectures and Recitations. JURISPRUDENCE AND POLITICAL ECONOMY—

Lectures. ENGLISH—Essays. ASTRONOMY—Newcomb and Holden's. Lectures. CHEMISTRY—Lectures. GEOLOGY—Le Conte's. Lectures.

ELECTIVE STUDIES.

*In Philosophy*—HISTORY OF PHILOSOPHY. SCIENCE AND RELIGION—Lectures. INTERNATIONAL AND CONSTITUTIONAL LAW—Gallaudet's Manual. Lectures. HISTORY OF ART—Ancient.

*In Literature*—LATIN AND THE SCIENCE OF LANGUAGE—Lucretius. Lectures on General Principles of Philology and on Comparative Inflection and Syntax. GREEK—Sophocles : *Œdipus Tyrannus*. Greek Literature. GERMAN—Review of Grammar. Lessing : *Minna von Barnhelm*. Goethe : *Hermann und Dorothea* ; *Faust*, first part. Schiller : *Jungfrau von Orleans*. Lectures on the History and Literature of the Language. SANSKRIT—Perry's Primer.

*In Science*—MATHEMATICS. ASTRONOMY—Practical. PHYSICS—Practical course in the Laboratory, or Mathematical Physics. APPLIED CHEMISTRY. BIOLOGY or PALÆONTOLOGY. HISTOLOGY.

EXHIBIT OF STUDIES FOR THE FOUR  
ACADEMIC YEARS.

NOTE—The numbers indicate hours per week.

FRESHMAN YEAR STUDIES.

ALL REQUIRED.

<i>First Term.</i>		<i>Second Term.</i>		<i>Third Term.</i>	
Latin,	4	Latin,	5	Latin,	5
Greek,	5	Greek,	4	Greek,	4
Math,	4	Math.,	4	Math.,	4
English,	2	French,	2	French,	2
	—		—		—
Total hours,	15		15		15

SOPHOMORE YEAR STUDIES.

ALL REQUIRED.

<i>First Term.</i>		<i>Second Term.</i>		<i>Third Term.</i>	
Latin,	3	Latin,	3	Latin,	3
Greek,	4	Greek,	4	Greek,	3
Math.,	3	Math.,	3	Math.,	3
History,	2	English,	2	English,	2
French,	2	French,	2	French,	2
Anatomy,	1	Zoölogy,	1	Botany,	2
<hr/>		<hr/>		<hr/>	
Total hours,	15		15		15

JUNIOR YEAR STUDIES.

I. REQUIRED.

<i>First Term.</i>		<i>Second Term.</i>		<i>Third Term.</i>	
Physics,	4	Physics,	3	Physics,	3
English,	2	English,	2	English,	2
Psychology,	2	Psych. & Logic,	3	Logic,	3
<hr/>		<hr/>		<hr/>	
Hours req'd,	8		8		8

II. ELECTIVE.

(The student selects three subjects.)

Latin,	2	Latin,	2	Latin,	2
Greek,	2	Greek,	2	Greek,	2
Math.,	2	Math.,	2	Math.,	2
French,	2	German,	2	German,	2
History,	2	History,	2	History,	2
Anglo-Saxon,	2				
		Phys. Geog.,	2	Phys. Geog.,	2
<hr/>		<hr/>		<hr/>	
Hours elect.,	6		6		6
<hr/>		<hr/>		<hr/>	
Total hours,	14	.	14		14



SENIOR YEAR STUDIES.

I. REQUIRED.

<i>First Term.</i>		<i>Second Term.</i>		<i>Third Term.</i>	
Astronomy,	3	Ast. & Geology,	3	Geology,	3
Chemistry,	2	Chemistry,	2	Chemistry,	2
Ethics,	2	Ethics,	1		
		Sc. and Rel.,	1	Sc. and Rel.,	1
Jur. and. Pol Ec.	2	Jur. and Pol. Ec.	2		
	<hr/>		<hr/>		<hr/>
Hours req'd,	9		9		6

II. ELECTIVE.

(The student selects 6 or 7 hours.)

1. *Philosophy.*

Metaphysics,	2	Hist. Philos.,	2	Hist. Philos.,	2
Comp. Pol.,	2	Sc. and Rel.,	2	Sc. and Rel.,	2
Phys. Psyc.,	2	Internat. Law,	2	Internat. Law,	2
Archæology,	2	Hist. Art,	2	Hist. Art,	2
Pedagogics,	2				

II. *Literature.*

Greek (O.),	2	Greek (C.),	2	Greek (C.),	2
English,	2	Latin,	2	Latin,	2
French,	2	German,	2	German,	2
Sanskrit,	2	Sanskrit,	2	Sanskrit,	2

III. *Science.*

Math.,	2	Math.,	2	Math.,	2
Pract. Astr.,	1 (2)	Pract. Astr.,	1 (2)	Pract. Astr.,	1 (2)
Physics,	1 (2)	Physics,	1 (2)	Physics,	1 (2)
Lab. Chem.,	2 (3)	App. Chem.,	1	App. Chem.,	1
Biol. or Pal.,	1 (2)	Biol. or Pal.,	1 (2)	Biol. or Pal.,	1 (2)
		Histology,	1 (2)	Histology,	1 (2)

Hours elect,	<hr/> 6 or 7	6 or 7	6 or 7
Tot. hours,	<hr/> 15 or 16	15 or 16	12 or 13

1. BIBLE, ORATORY and ESSAYS are required throughout the four years.
2. Senior Electives marked 1 (2) occupy one hour per week on the Weekly Schedule, but count as two-hour Electives, on account of extra laboratory and observatory work. Lab. Chem. counts as a three-hour Elective.

## FRESHMAN WEEKLY SCHEDULE—FIRST TERM.

	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.	SATURDAY.
I.	8½	Euclid	English	Livy	Greek (W.)	Bible
	10	Livy	English	Homer	Euclid	Livy
	11	Greek (W.)	Greek (W.)	Latin Prose	Algebra	
	8	Livy	English	Homer	Livy	Bible
	4	Euclid	English	Livy	Greek (W.)	Algebra
II.	8½	Algebra	English	Latin Prose	Euclid	
	10	Homer	Greek W. (5)	Latin Prose	Euclid	
	11	Algebra	English	Latin Prose	Greek (W.)	
	8	Euclid	English	Latin Prose	Euclid	
	4	Homer	Greek W. (5)	Latin Prose	Euclid	
III.	8½	Algebra	Livy	English	English	Bible
	10	Latin Prose	Greek (W.)	Livy	Livy	Greek W.
	11	Euclid	Euclid	Homer	Greek (W.)	
	8	Homer	Greek (W.)	Elocution	Greek (W.)	
	4	Algebra	Euclid	Elocution	Greek (W.)	
IV.	8½	Homer	Greek (W.)	English	English	Bible
	10	Latin Prose	Livy	Greek (W.)	Algebra	Euclid
	11	Livy	Euclid (5)	Homer	Greek (W.)	
	8	Algebra	Euclid (5)	Homer	Algebra	
	4	Livy	Euclid (5)	Homer	Elocution	

FRESHMAN WEEKLY SCHEDULE—SECOND TERM.

WEEKLY SCHEDULES.

	MONDAY.	TUESDAY.	WEDNESDAY	THURSDAY.	FRIDAY.	SATURDAY.
I.	8½ 10 11 3 4 Algebra French	Homer Livy Algebra	French Euclid Greek (W.)	Livy Horace Homer	Greek (W.) Livy Horace	Bible Euclid
II	8½ 10 11 3 4 Algebra Homer	French Algebra Livy	Euclid French Greek (W.)	Euclid Horace Homer	Livy Greek (W.) Horace	Bible Livy
III.	8½ 10 11 3 4 Homer Algebra	Livy Algebra French	Greek (W.) Livy Euclid	French Homer Livy	Euclid Horace Greek (W.)	Bible Horace
IV.	8½ 10 11 3 4 Homer Algebra	Algebra Livy French	Livy Greek (W.) Euclid	Homer Livy Euclid	French Horace Greek (W.)	Bible Horace

SOPHOMORE WEEKLY SCHEDULE—FIRST TERM.

	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.	SATURDAY.
I.	8½ 10 11 3 4	Latin (P.)  French Math.	History  Latin (P.) Latin (P.)	Anat. & Phys.  Greek (O.) Greek (O.) Greek (O.)	Greek (O.)  History Greek (O.) Greek (O.)	Bible  French
	8½ 10 11 3 4	Latin (W.)  French Math.	History  Latin (W.) Latin (W.)	Greek (W.)  Anat. & Phys. Greek (W.) Greek (W.)	Greek (C.)  History Greek (C.) Greek (C.)	Bible  French

SECOND AND THIRD TERMS.

I.	8½ 10 11 3 4	Latin (W.)  French Math.	English  Latin (W.) Latin (W.)	Greek (W.)  Zoöl. & Bot. Greek (W.) Greek (W.)	Greek (C.)  English Greek (C.) Greek (C.)	Bible  French
	8½ 10 11 3 4	Latin (P.)  French Math.	English  Latin (P.) Latin (P.)	Zoöl. & Bot.  Greek (O.) Greek (O.) Greek (O.)	English  Greek (O.) Greek (O.) Greek (O.)	Bible  French

One of the Greek exercises is replaced by Botany in third term.

JUNIOR WEEKLY SCHEDULE—FIRST TERM.

	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.	SATURDAY.
8½	PHYSICS	PHYSICS	PSYCHOLOGY	Latin	Latin	BIBLE
10				Anglo-Saxon	Anglo-Saxon	
11	Greek	Mathematics	PSYCHOLOGY	Mod. Lang.	Mod. Lang.	ENGLISH
3	Greek	Greek			Mathematics	
4	PHYSICS	PHYSICS	Hist. (5 p. m.)	History	ENGLISH	

SECOND AND THIRD TERMS.

8½	PHYSICS	PSYCHOLOGY <sup>1</sup> LOGIC <sup>2</sup>	PSYCHOLOGY <sup>1</sup> LOGIC <sup>2</sup>	Latin	Latin	BIBLE
10				Mod. Lang.	Phys. Geog.	
11	Greek	Mathematics	PSYCHOLOGY <sup>1</sup> LOGIC <sup>2</sup>	Phys. Geog.	Mod. Lang.	ENGLISH
3	Greek	Greek			Mathematics	
4	PHYSICS	PHYSICS	History	History	ENGLISH	

<sup>1</sup> Until Feb. 1st.      <sup>2</sup> From Feb. 1st.

## SENIOR WEEKLY SCHEDULE—FIRST TERM.

	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.	SATURDAY.
8½	JUR. and POL.	ASTRONOMY.	Physics Biology	Math. Physics Comp. Politics	German Archæology	BIBLE
10	Pract. Astron.		Metaphysics	{ Archæology Pedagogics	Greek (O)	Paleontology
11	Metaphysics	ETHICS	ASTRONOMY	English	English	CHEMISTRY
3	Greek (O.)		Pedagogics	German	Comp. Politics	
4	JUR. and POL.	ASTRONOMY	Phys. Psychol.	Lab. Chemistry	CHEMISTRY	
5		Lab. Chemistry	ETHICS			

## SECOND AND THIRD TERMS.

8½	JUR. and POL. <sup>1</sup>	ASTRONOMY <sup>1</sup> GEOLOGY <sup>2</sup>	ASTRONOMY <sup>2</sup> GEOLOGY <sup>2</sup>	Int. and Const. Law	German	BIBLE
10	Pract. Astron.			Hist. Phil.	Greek (C.)	Paleontology
11	Hist. Phil.	ETHICS <sup>1</sup>	Sci. and Rel.	Latin	Latin	CHEMISTRY
3	Greek (C.)		Physics Biology	German Histology	Int. and Const. Law	
4	JUR. and POL. <sup>1</sup>	ASTRONOMY <sup>1</sup> GEOLOGY <sup>2</sup>	{ Sci. & Rel. Hist. of Art.	Applied Chem.	CHEMISTRY	

<sup>1</sup> Through Second Term.<sup>2</sup> Until Feb. 1st. <sup>3</sup> After Feb. 1st.

Mathematics and Sanskrit; hours to be arranged with the Professors in charge.  
Bracketed electives are mutually exclusive.

## EXAMINATIONS, STANDING AND GRADUATION.

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### EXAMINATIONS.

*Regular Examinations.*—At the end of each term each class is ordinarily examined in the studies of that term. At the close of the third term the examination in certain subjects embraces not only the work of that term, but the course of the entire year.

*Partial Examinations and Written Recitations.*—In addition to the regular examinations, partial examinations or written recitations are held from time to time during the term.

*Divisional Examinations.*—In the Freshman class, a special examination is held early in the first term, the results of which determine the distribution of the class into graded divisions. These are reorganized at the beginning of the second and third terms, according to the results of the last preceding regular examination.

*General Regulations.*—Examinations are for the most part conducted in writing, but in certain subjects are oral in whole or in part. Private examinations are not allowed except in extreme cases, and by special permission of the Faculty. Absence from an examination, except for reasons of absolute necessity, will be regarded as a serious delinquency, and a subsequent examination will not be granted except by a vote of the Faculty.

#### *Regulations in Respect to the Removal of Conditions.*

Students who shall appear to the Faculty, on examination, to be deficient in their studies, will be dealt with according to the nature and extent of the deficiency. Any member of any one of the three lower classes who shall fail to pass the examinations at the end of any term in more than two departments, involving as much as six hours of schedule time,

shall be dropped from his class and shall be required to enter a lower class or to withdraw from College. If the failure be in not more than two departments, the student may be allowed a second trial at the beginning of the next term; if he fail in this second examination, he shall employ a tutor approved by the Faculty, and be allowed four weeks for further preparation; but if he still fail to pass, he shall be required to enter a lower class or withdraw from College.

In the Freshman class, failure with either instructor in Greek, in Latin, or in Mathematics, is reckoned as a separate failure in the application of the above rules.

The Senior class will be subject to the same regulations as the three lower classes so far as regards the examinations at the close of the *first* term, and the removal of any conditions then incurred.

In the application of these regulations, special cases, arising from illness or other causes, will be duly considered.

*On the second day of each term, Thursday, at 10 o'clock, A. M., all delinquent or unexamined students are required to meet in the Old Chapel to make arrangements with their instructors for examination in the subjects in which they are deficient. This does not apply to entering students.* In the first term, this examination is to take place immediately at the beginning of the term; in the second and third terms, two weeks are allowed for it. Any student not present as thus directed, or not prepared for examination at the time appointed, will be debarred from another opportunity, except by special vote of the Faculty.

### STANDING.

The results of the term examinations are combined with those of the recitations to decide the relative standing or rank of the student. The maximum mark in each study is one hundred; the minimum or passing mark is fifty. Students falling below the passing mark in any study are conditioned, and in order to continue with the class must be re-examined.

Each instructor after computing from recitations and examinations the marks of his classes determines each student's rank



by assigning him to one of six *groups* into which the class is divided. These groups are constituted and numbered in order of merit—those students whose marks indicate the highest attainments being assigned to the first group, the next highest to the second group, and so on through the six groups. The first group is to contain not less than one-thirtieth, nor more than one-tenth of the class; the second, fourth and fifth groups each not more than one-fifth; the third not more than one-fourth; and the sixth group comprises the remainder of the class, except those not fully examined.

The general rank of a student is determined by combining his group-numbers in the several studies in proportion to the allotted schedule time of each. Those students whose averages are highest, and above an established limit, are assigned to the first general group, those next highest to the second general group; and so on, through the six general groups.

The first and second general groups for the year, of the Junior, Sophomore and Freshman classes, constitute the Honor groups of these classes, and are published in the Catalogue of the following year—the names included in each group being printed in alphabetical order.

In determining a student's standing, essays count as one hour per week throughout each of the four years. Account is taken of attendance and conduct as well as scholarship, according to the published rules of the Faculty.

A report of the standing of each student is made to his parent or guardian by the Registrar of the College at the close of the first term and at the close of the year. The latter report gives also the standing for the whole year.

## GRADUATION.

### *Bachelor's Degree.*

Students who pass their final examination are ordinarily recommended by the Faculty for the Degree of Bachelor of Arts, and if the recommendation is approved by the Trustees, the

degree is conferred at Commencement, and they receive diplomas signed by the President and the Clerk of the Board of Trustees.

No student will be recommended to the Trustees for a degree who fails to pass the examinations at the close of the last term of the Senior year.

Any member of the Senior class failing to pass the regular final examination in but *one* of his studies may, by vote of the Faculty, be allowed a re-examination, and if successful in passing this, may be recommended to receive his degree with his class.

Any member of the Senior class failing to pass the regular final examination in *two* of his studies may, by vote of the Faculty, be allowed a re-examination, and if successful in this may be recommended for a degree *at some time in the next Academic year*.

#### *Final Rank and Graduation Honors.*

The final rank of members of the graduating class is computed by combining the averages for the several years of the course, and the Faculty then determines the limits of the six general groups of the graduating class, and also what portion of the class shall be printed as the Honor List—the names of the members of each group of the Honor List being printed in alphabetical order.

The first and second general groups thus determined are the Honor groups of the graduating class, and are designated *magna cum laude* and *cum laude* respectively.

The higher distinction of *insigni cum laude* and the highest of *summa cum laude* are reserved for very unusual excellence.

#### *Commencement Appointments.*

Commencement orations and theses, indicative of general or special excellence, are awarded by the Faculty to such students as are deemed worthy of distinction. The student whose individual rank is highest is ordinarily awarded the Latin Salutatory by vote of the Faculty. In like manner the student

whose individual rank is the next highest receives the English Salutatory. The Valedictory is awarded with special regard to the qualifications of the student as a valedictorian, as well as on the ground of scholarship. Orations and theses designated as Philosophical, Classical, Mathematical, Physical, Metaphysical, Ethical, Historical, Literary, Belles Lettres, Modern Language, are awarded to students eminent in the corresponding departments.

In the award of all degrees and honors, regard is had to the conduct of the student during his course, and any student who has incurred serious discipline may be debarred from the rank to which otherwise his scholarship would have entitled him.

# THE JOHN C. GREEN SCHOOL OF SCIENCE.

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## FOUNDATION AND ORGANIZATION.

This institution is a department of the College of New Jersey, founded in 1873 upon an endowment by Mr. John C. Green.

Its design is to furnish more extended and special instruction in the Natural Sciences, providing a course in General Science for undergraduate students and also various graduate courses. The course in Civil Engineering was added in 1875, by further endowment from the residuary legatees of Mr. Green, and subsequently the elective courses in certain branches of the natural sciences were established.

The undergraduate courses offer, according to the choice of the student, efficient education in the natural sciences in general, or a thorough training in the study of civil engineering and in various other branches of science, pure and applied. At the same time a liberal education in certain Academic studies is secured to all candidates for a degree.

Graduate courses of study for the degrees of Master of Science and Doctor of Science are provided; and also special courses which, under certain conditions, may be taken by students who are not candidates for any degree.

Instruction is given by lectures and recitations,—by practice in the laboratories, drawing rooms, museums and field,—and excursions are made to different points of interest.

Before receiving his degree every student must present to the Faculty an acceptable thesis on some scientific subject, the nature of which will depend upon the course he has pursued.

## ADMISSION.

### ENTRANCE EXAMINATIONS.

All entering students on their arrival must report at the President's house and register. The first examination for admission will begin in Princeton on Thursday, June 28d, 1887, at 11 A. M., and will continue through the afternoon of Friday. The second will begin on Tuesday, September 13th, at 11 A. M., and continue through the afternoon of Wednesday. Applicants who have conditions or other deficiencies from the June examination are expected to remove them at this time. *Attendance is required at the beginning of the examination.*

Simultaneously with the June entrance examinations in Princeton, examinations are held in the following cities, viz.: Pittsburgh, Cincinnati, Louisville, Chicago, St. Louis, Omaha, Denver and San Francisco; and at preparatory schools and other cities when necessary. The precise places in which the examinations are to be held can be learned by application to the President. Due notice of these examinations will also be published in leading local newspapers for several weeks in advance.

Examinations at other times and places than those specified are very inconvenient and often impracticable, and applicants for admission at other than the regular days are required to pay \$10 into the treasury.

Candidates for admission to the Freshman class must be at least sixteen years of age. They will be examined in the following books and subjects :

**ENGLISH:** Grammar—Whitney, or Reed and Kellogg (Higher Lessons); Modern Geography—Guyot's Grammar-School Geography; U. S. History—Anderson's or Johnston's; Essay—the theme for 1887 will be based on the life of Scott or of Franklin. The attention of preparatory schools is called to the need of a more thorough study of elementary English. **MATHEMATICS:** Arithmetic entire, including the Metric system, a practical knowledge of which is indispensable; Algebra, through quadratic equations involving two unknown quantities, including evo-

lution, radicals, theory of exponents; Geometry—plane geometry entire (five books of Chauvenet's Geometry or their equivalent). FRENCH : The elements of Grammar (Otto, pp. 28-201, or Delille's Condensed Instruction, pp. 11-143), and the translation of fifty pages of simple French prose. PHYSICAL GEOGRAPHY : The elements, as contained in Guyot's Grammar-School Geography.

Candidates for the degree of Bachelor of Science will be examined (in addition to the subjects above enumerated) in LATIN : Grammar, with special attention to parsing, and the retranslation from English into Latin of simple sentences from the First Book of Cæsar ; Translation, Cæsar (five books of the Gallic War), Cicero (the four orations against Catiline), or equivalents from other Latin authors.

It is recommended that *all* candidates should receive instruction in free hand drawing before their entrance.

#### OTHER REQUIREMENTS.

Candidates for admission to an advanced class will be examined in the studies previously pursued by the class they propose to enter.

All candidates for admission must bring satisfactory testimonials of moral character, and if the candidate has been a member of another college, university, or similar institution, he must produce a certificate from its President or Faculty that he is free from censure in the same.

No candidate is admitted without an examination and a vote of the Faculty.

Immediately after the opening<sup>1</sup> of the College the entering students meet according to announcement for the registration of their names and subscription to the following pledge, required by the Board of Trustees :

We, the undersigned, do individually for ourselves promise, without any mental reservation, that we will have no connection whatever with any secret society, nor be present at the meetings of any secret society in this or any other College so long as we are members of the College of New Jersey; it being understood that this promise has no reference to the American Whig and Cllosophic Societies. We also declare that we regard ourselves bound to keep this promise and on no account whatever to violate it.

## UNDERGRADUATE COURSES.

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Undergraduate courses are provided for the Degrees of Bachelor of Science, and of Civil Engineer.

Candidates for the degree of Bachelor of Science pursue the course in *General Science* until the end of the first term of the Junior year, after which they may continue in that course, or pursue one of the following four Elective Courses: Chemistry and Mineralogy; Biology and Chemistry; Biology and Geology; Mathematics and Mechanics.

In the Senior year students taking the course in General Science, or the elective course in Mathematics and Mechanics, may pursue a select course in Physics or Practical Astronomy.

The student must announce his election before the end of the first term of the Junior year. He cannot afterwards change his course without the permission of the Faculty.

The course in *Civil Engineering* diverges from that in General Science at the very beginning of the Freshman year.

*Special Students.*—For persons who may desire to devote special attention to any of the scientific studies of the School, arrangements can be made with the Professors of those branches, if the Professor in charge shall, after due investigation, decide that the applicants can pursue such studies with advantage. Every facility will be offered for their advancement in the studies selected, with the personal supervision of the Professor and full access to the collections, etc.; but it must be distinctly understood that this opportunity is intended only for those who desire to obtain proficiency in special branches, and not for students who have failed to keep up with the regular classes. Special students will be required to give evidence of satisfactory progress in their studies. To those passing successful examinations in the branches selected, certificates of proficiency will be given. The branches open to special students include: geology, mineralogy, biology, physics, practical astronomy, analytical and applied chemistry, assaying, topography.

## **COURSES FOR THE DEGREE OF BACHELOR OF SCIENCE.**

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### **COURSE IN GENERAL SCIENCE.**

This course is especially intended to furnish instruction in the natural sciences in general, and the required studies of the course are indicated in the synopsis on pp. 105-107. After the beginning of the second term of the Junior year, the student pursues, under the direction of the Faculty, elective studies in various branches of science, to occupy the hours not devoted to the required studies.

### **STATEMENT OF STUDIES.**

#### **Modern Languages.**

##### **PROFESSOR HUSS.**

Instruction in Modern Languages comprises German and French as required studies throughout the entire course, the number of exercises being given in the synopsis, pp. 105-107.

In the Freshman year the student begins and completes the etymological part of German grammar. The instruction is, at the very outset, conducted with a view to familiarizing the student not only with reading and writing, but also with speaking the foreign idiom; for which latter purpose conversational exercises are constantly resorted to and especial attention is given to pronunciation. In French, the etymology of grammar is reviewed.

In the Sophomore year the instruction bears on syntax, with oral and written exercises in French and German prose, particular attention being given to the intricacies of the German period.

The Junior year and the first two terms of the Senior year are devoted to a critical study of the masterpieces of German and French literature, with lectures thereon.



## **Mathematics.**

**PROFESSOR ROCKWOOD.**

The Mathematical course, which is the same for all students of the School of Science, is intended to be so framed as to supply the necessary foundation in knowledge and training for the later studies of physics and mechanics, and especially finds its natural continuation in the applied mathematics of the course in Civil Engineering. The fact that the student's mathematical knowledge is thus to be *used* in other departments is carefully kept in view, not only in selecting the subjects to be studied, but in arranging their order and the relative time to be devoted to each, so that he may be properly prepared for the work before him. In this connection also especial mention may be made of the constant black-board practice, which is a prominent feature of the instruction, and gives the student a practical as well as a theoretical familiarity with the processes, preparing him for their ready use afterward in the special investigations of his later studies.

The student is required, at the entrance examination, to be acquainted with Arithmetic, including the Metric system; Algebra through quadratic equations, including radicals and the theory of exponents; and with the principles of Plane Geometry as developed in the first five books of Chauvenet's Geometry.

During the whole of the first year the student devotes five hours a week to Mathematics. In the first term he finishes the study of Algebra (Wells), discussing the various forms of series, the subject of logarithms and the theory of equations.

In the second term Solid Geometry and Spherical Geometry are studied, the text-book being Chauvenet's treatise, and the subject being illustrated by a numerous and valuable collection of models, mostly from original designs. With the Geometry is combined a thorough course in Mensuration and an introduction to the elements of Modern Geometry. The third term is devoted to Plane Trigonometry, in which the student becomes accustomed to the practical use of logarithms, and a part of the first term of the Sophomore year is given to Spherical Trigonometry and its applications. The second and third terms of

the Sophomore year are devoted to the study of Analytical Geometry (Bowser), both of the plane and of space, with special reference to the conic sections. In the first term of the Junior year the Differential and Integral Calculus (Bowser) are studied, with five exercises a week; and the students in the course in Civil Engineering have a short supplementary course at the beginning of the second term in those more advanced portions of the Calculus which are especially applicable to their work. Throughout the whole course, the black-board drill is combined with abundant oral explanation and occasional formal lectures.

The Calculus ends the course in the Pure Mathematics required of all students. They pass then to the applications of their work in the special departments of Engineering, Physics, Astronomy, etc. Provision is, however, made for the further special study of the subject by the elective course in Mathematics and Mechanics.

### Graphics.

PROFESSOR WILLSON.

**MECHANICAL DRAWING.**—This study occupies fifteen exercises (two hours each) during the first term of the Freshman year, and embraces instruction in the use of drafting instruments and materials in the various operations of industrial science drawing: such as tinting and shading, both with pen and brush; lettering; the representation of metals, wood, rocks, earth, tiles and other materials of architectural and engineering construction; architectural drawings and tracing of the same, to scale, from measurements. Text-book: Warren's "Drafting Instruments and Operations."

**PLANE PROBLEMS AND ELEMENTS OF DESCRIPTIVE GEOMETRY.**—Instruction in these subjects occupies fifty-four exercises (two hours each) during the second term of the Freshman year, and embraces:

(a) The construction of the cycloid and other trochoidal curves, of the spirals and of the paths traced by points in link motions.

(b) The orthographic projections of points, lines, surfaces and solids (in the first angle), with problems of sections, interpenetrations and developments relating to the latter, including the five regular solids.

(c) Axonometric (including isometric) projections, with drawings from models, to scale, from measurements.

(d) Elementary problems of shades and shadows.

(e) Elementary problems of the point, line and plane in the four angles. Text-book : Angel's Practical Plane Geometry and Projection.

**DESCRIPTIVE GEOMETRY.**—This embraces a course of thirty exercises (two hours each), in the first term of the Sophomore year, on developable, double-curved and warped surfaces and trihedrals. Text-books : Warren's Descriptive Geometry ; Angel's Practical Plane Geometry and Projection.

**SHADES, SHADOWS, PERSPECTIVE AND SPHERICAL PROJECTIONS.**—A course occupying twenty-one exercises (two hours each) in the third term of the Sophomore year. It includes the graphical construction of the shades and shadows of developable, double-curved and warped surfaces ; perspective by the methods of the earlier French writers and also by those adopted in the present practice of American architects ; and, finally, the application of Descriptive Geometry in the more important methods of map projection, as the stereographic, Mercator's, polyconic, etc. Text-books : Warren's Descriptive Geometry, Wright's Architectural Perspective. Reference works : Craig's Treatise on Projections, Germain's Spherical Projections.

**FREE-HAND DRAWING.**—The object of this course is to furnish the training necessary to the making of such sketches or designs as are ordinarily required in the practice of the engineer or biologist. The drawings are, from the first, made directly from the object, and instruction is given in the application of the principles of shadows, shading and perspective. The course occupies students in the B. S. course twenty exercises (two hours each), and students in the C. E. course ten exercises (two hours each), in the first term of their Freshman year. Students in

the Biological Department have an additional course in more advanced work in their Senior year.

**ELECTIVE COURSES.**—Stereotomy (see course in Civil Engineering), may be elected by any student taking the elective course in Mathematics and Mechanics; and both Stereotomy and Machine Drawing (see course in Civil Engineering), may, in the Junior and Senior years, be elected by students taking the course in General Science, when no interference with other studies is occasioned.

**DRAFTING ROOM AND MODELS.**—The recitation and drafting room of the department of Graphics is well lighted and furnished with model cases and with desks for the accommodation of ninety-two students. The drawing courses in descriptive geometry, perspective, shades and shadows, architectural constructions (including stone-cutting), kinematics and machinery, are illustrated by a large collection of models, which includes a number of duplicates of the Olivier ruled-surface models, two hundred from the Messrs. Schröder, of Darmstadt, complete sets of the mathematical models designed by Professors Brill and Björling, a number of the "Muret" plaster models, and several warped surface models from designs by the professor.

### **Surveying.**

**PROFESSOR McMILLAN.**

This course, occupying twenty exercises in the first term of the Sophomore year, is designed to teach the student the outlines, principles and applications of the different subdivisions of Geodesy, and to familiarize him, in a general way, with surveying practice. Field exercises are intermingled with the recitations, and the subject is thus rendered more intelligible and attractive.

### **General Chemistry.**

**PROFESSOR SCHANCK.**

The instruction in this study occupies two hours a week during the Sophomore year, being the same as that in the re-

quired course in General Chemistry, of the Academic classes. Students pursuing the course in General Science also attend Professor Schanck's elective course in Applied Chemistry, during the Senior year.

### **Analytical Chemistry and Mineralogy.**

PROFESSOR CORNWALL AND DR. McCAY.

**MINERALOGY.**—The elements of Crystallography are taught by a course of lectures in the second and third terms of the Freshman year. Determinative Mineralogy, with the blowpipe, is taught during the whole of the first term of the Sophomore year, in a course of forty-six exercises (two hours each). In the Senior year a course of lectures on Descriptive Mineralogy, with practice in the determination of minerals by their physical characteristics, together with the optical study of minerals and rocks, may be elected by the students in the course in General Science.

**ANALYTICAL CHEMISTRY.**—During the second and third terms of the Sophomore year, the students attend lectures by Professor Cornwall, with recitations, and also work in the laboratory, under Dr. McCay, pursuing the study of Qualitative Chemical Analysis, with Fresenius' Manual as a guide. Four exercises a week (of two hours each) are given to the study of the detection of bases, together with instruction in the tests for the common acids, inorganic and organic. During the Junior and Senior years instruction in Quantitative Chemical Analysis may be taken as an elective.

### **Botany.**

PROFESSOR MACLOSIE.

During the Freshman year Botany is a required study. There are five exercises a week (two hours each), for fourteen weeks. The work of the class is exclusively practical, and includes the examination of plants as to their morphology, histology, modes of development, and physiology. Students are taught to use their hands and eyes, to avail themselves of mi-

microscopical appliances, to master the characters of the larger orders of plants, and are exercised in phytography by describing and drawing what they see. The text-books and manuals are used for reference, but each student is required to prepare his own text-book by noting down the results of his own examination of typical plants. Botanical excursions are made in the spring season to the surrounding districts, and an original thesis on some botanical subject is required of each student. (Books recommended: Macloskie's Elementary Botany; Gray's Manual of Botany; Bessey's Briefer Course Botany. Books of reference: Sach's Text-Book of Botany; Eichler's Blüthendiagramme; H. Müller's Fertilization of Flowers; Le Maout and Decaisne's Botany; Bentham and Hooker's Genera Plantarum; De Candolle's Prodrômus. Also the monographs on special groups of flowering and flowerless plants.)

### **Biology.**

**PROFESSORS MACLOSKIE, LIBBEY AND OSBORN.**

During the Sophomore year all candidates for the degree of Bachelor of Science have an elementary course in Zoölogy, consisting of fifty-two exercises, during the second and third terms. The studies of the second term, under Professors Macloskie and Osborn, consist of lectures and practical work upon the invertebrates and vertebrates. In the second and third terms Professor Libbey gives a course in Histology and use of the microscope. During the first term of Junior year Professor Osborn gives a course of lectures upon the Comparative Anatomy and Physiology of the Birds, accompanied by an introductory course of dissection of the pigeon.

These required courses are introductory to the elective courses in Biology and Chemistry and Biology and Geology of the Junior and Senior years.

### **Studies Pursued in Common with the Academic Classes.**

The following studies are pursued either together with the Academic classes, or essentially as stated under the corresponding titles in the Academic course, and under the same instructors.

Psychology or Logic, according to the election of the student; Political Economy; English Literature, the essays and orations required from the Senior class in the Academic course being replaced in the Scientific course by the preparation and reading of theses on scientific subjects; Rhetoric and English Language; Oratory; Physics; Astronomy; Geology; Human Physiology and Anatomy.

### SYNOPSIS OF COURSE.

The required studies of the course in General Science are indicated in the following synopsis, the bracketed figures denoting the number of exercises in each subject :

#### FRESHMAN YEAR.

##### *First Term.*

**MATHEMATICS** : Algebra completed (Wells'); [65]. **ENGLISH** : Elementary Discourse (Diction and Sentences); Trench (Study of Words and Select Glossary); Lounsbury's English Language, pp. 1-90; Lectures and Essays; [26]. **MODERN LANGUAGES** : German : Huss' System of Oral Instruction; [52]. **BOTANY** : Flowering Plants; Morphology of Plants (Macloskie's Botany); [30]. **DRAWING** : Mechanical; [15]. Free-hand; [20]. **ORATORY** : Lectures and Drill in Elocution.

##### *Second and Third Terms.*

**MATHEMATICS** : Solid and Spherical Geometry (Chauvenet); Mensuration; Plane Trigonometry; [95]. **MODERN LANGUAGES** : German : Huss' System of Oral Instruction, completed : French : Delille's Condensed Instruction; [95]. **BOTANY** : Flowerless Plants; Herborizing; Vegetable Histology (Macloskie's Botany; Bessey's Botany, Briefer Course; Gray's Manual of Botany); [35]. **DRAWING** : Projections and Descriptive Geometry; [54]. **MINERALOGY**; Crystallography; [25]. **ENGLISH** : Essays.

## SOPHOMORE YEAR.

*First Term.*

DESCRIPTIVE GEOMETRY; [30]. GENERAL CHEMISTRY: Inorganic; [26]. MINERALOGY: Determinative; [46]. HUMAN ANATOMY AND PHYSIOLOGY; [13]. GERMAN: Syntax; FRENCH: Syntax; also oral and written exercises in both languages; [52]. MATHEMATICS: Spherical Trigonometry and its applications; [21]. SURVEYING: [20]. ENGLISH: Essays.

*Second and Third Terms.*

MATHEMATICS: Analytical Geometry; [63]. SHADES, SHADOWS, PERSPECTIVE and SPHERICAL PROJECTIONS (Warren); [21]. GENERAL CHEMISTRY: Inorganic; [38]. ANALYTICAL CHEMISTRY: Qualitative Analysis; [76]. ZOÖLOGY: [32]. HISTOLOGY: [20]. ENGLISH: Principles of Discourse, (Hunt); ENGLISH LANGUAGE: Marsh's Lectures on English Language; Marsh's Origin and History of English Language; Lectures on English Language and Style; Essays; [38]. GERMAN: Syntax completed; FRENCH: Syntax completed; Oral and written exercises continued; [53]. ORATORY: Elocution, Declamation, Written Orations.

## JUNIOR YEAR.

*First Term.*

MATHEMATICS: Differential and Integral Calculus [65]. PHYSICS: Elementary Mechanics; Properties of Bodies; Mechanics of Fluids; Heat; [52]. ZOÖLOGY: Vertebrates (Packard's Zoölogy; Balfour's Comparative Embryology); [13]. ENGLISH LITERATURE: Chaucer; Lectures; [26]. MODERN LANGUAGES: German: Lessing. French: Racine. [26]. PSYCHOLOGY; [26].

*Second and Third Terms.*

PHYSICS: Electricity and Magnetism; Acoustics; Optics; [57]. ANALYTICAL CHEMISTRY: Quantitative Analysis.\* BIOLOGY: Vertebrates.\* HISTOLOGY; [20]. ENGLISH LITERA-



**TURE:** Lectures; [38.] **MODERN LANGUAGES:** German: Schiller; Goethe. French: Molière; Corneille; [45]. **LOGIC,** [38]; or **PSYCHOLOGY,** [9]. **ORATORY:** Composition and Delivery, Reading.

### SENIOR YEAR.

#### *First Term.*

**ASTRONOMY:** General; [39]. **GENERAL CHEMISTRY:** Applied; [18]. **ANALYTICAL CHEMISTRY:** Quantitative Analysis.\* **BIOLOGY.\*** **MODERN LANGUAGES:** German: Goethe. French: Victor Hugo. Reading scientific prose at sight; [26].

#### *Second and Third Terms.*

**ASTRONOMY:** General; [12]. **GENERAL CHEMISTRY:** Applied; [18]. **ANALYTICAL CHEMISTRY:** Quantitative Analysis.\* **BIOLOGY.\*** **HISTOLOGY;** [18]. **MODERN LANGUAGES:** Studies of first term continued through the second term; [26]. **POLITICAL ECONOMY;** [26]. **GEOLOGY;** [38]. **ORATORY:** Reading of essays on scientific subjects.

## COURSE IN CHEMISTRY AND MINERALOGY.

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This course, which is designed to afford thorough instruction in Analytical and Technical Chemistry, is one of the elective courses; and students electing it enter upon the special studies of the course at the beginning of the second term of their Junior year. They pursue also the following required studies of the Junior and Senior years in the course in General Science:—Modern Languages; Political Economy; Psychology or Logic; English Literature; Physics; Astronomy; Geology; Zoölogy; Drawing; Oratory.

The remainder of the time during these two years is devoted to the following special studies of this course:—

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\*Varies according to other elective studies taken.

**QUALITATIVE ANALYSIS.**—This subject, previously pursued so far as stated on page 108, is continued, so as to include the detection of inorganic and organic acids as well as bases, in complex substances.

**QUANTITATIVE ANALYSIS.**—A full course, including the analysis of chemical and metallurgical products, ores, fertilizers, sugar, water, etc. Volumetric methods are freely used whenever they are appropriate.

**ASSAYING.**—Furnace assay of Ores; Bullion assays.

**BLOWPIPE ANALYSIS.**—Qualitative (required); Quantitative (optional).

**TECHNICAL CHEMISTRY and APPLICATIONS OF CHEMISTRY to Medicine and Hygiene,** including toxicology, analysis of potable waters, adulterations of food, disinfectants. Lectures and recitations.

**MINERALOGY.**—Descriptive and Determinative (the latter chiefly based upon the physical characters of the minerals).

**LITHOLOGY.**—Descriptive and Determinative, with microscopical examination of typical rocks.

In the above subjects the instruction embraces lectures by Professor Cornwall, with recitations upon the lectures and upon portions of the manuals mentioned below, and also laboratory practice (except in technical Chemistry) under the Professor and Dr. McCay; the latter lecturing also upon Volumetric Analysis. All chemical reactions are fully explained by the use of chemical formulas, and the student must show that he understands the theory of all the operations he performs or describes.

The graduation thesis presented by the student must embody the result of the student's own work in the laboratory, whether it be experimental or analytical.

**Text-books.**—Fresenius' Manuals of Qualitative and Quantitative Chemical Analysis; Ricketts' Notes on Assaying; Cornwall's Blowpipe Analysis. Reference is frequently made to other works and to scientific periodicals.

## COURSE IN BIOLOGY AND CHEMISTRY.

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This course is recommended to students who intend afterwards to pursue the study of medicine. Students electing it remain candidates for the degree of Bachelor of Science. The special studies of the course begin with the second term of the Junior year, half of the time devoted to such studies being allotted to biology and half to chemistry. For the present year the division is made as follows :

**I. BIOLOGY.**—In this branch Prof. Macloskie gives a series of exercises on the anatomy of type forms of invertebrate animals, on comparative physiology, and on the morphology and embryology of plants. The text-books recommended are: Packard's Zoölogy, Foster's Physiology, Brooks' Handbook of Invertebrate Zoölogy, Huxley on the Cray-fish, Balfour's Comparative Embryology, Leidy's Freshwater Rhizopods, Macloskie's Elementary Botany, Be-sey's Botany, Sach's Botany.

Professor Osborn, with Mr. Phillips, conducts two exercises a week during the second and third terms of the Junior year, and two a week during the second and third terms of the Senior year. This portion of the work is intended as an introduction to the study of Human Anatomy and embraces a thorough course in dissection and study of the skeleton of the cat and rabbit, employing the text-books of Parker (Zoötomy) and Wiedersheim (Comparative Anatomy). There is also a course of lectures upon Embryology in third term of each year, with practical work upon the development of the chick and frog.

During second and third terms Professor Libbey conducts one exercise a week in Histological methods, in which the class are required to work practically upon subjects assigned, and to present theses upon the results obtained.

**II. CHEMISTRY.**—This part of the course will embrace classroom exercises under Prof. Cornwall and laboratory work under his supervision, with the aid of Dr. McCay. After learning how to make quantitative analyses of a number of simple and complex inorganic substances, by the use of gravimetric and volumetric methods, the students will study the properties of the

various typical organic compounds, such as alcohols, carbohydrates, acids, etc., as well as of fats, urea, milk and other bodies of interest to the student of physiological chemistry, and will be trained in the methods of analyzing and estimating the same, reference being made to appropriate manuals and current scientific literature. Lectures will also be given upon the applications of Chemistry to Medicine and Hygiene, including toxicology, analysis of potable waters, adulteration of food, disinfectants, and similar subjects.

### COURSE IN BIOLOGY AND GEOLOGY.

The special objects of this course are to qualify students who elect it to become original investigators or teachers of the special branches of science included in it.

Until the close of the first term of Junior year the studies are not specialized, but are the same as in the course in General Science. The special studies in biology and geology begin with the second term of the Junior year. The course embraces the following subjects :

I. ZOÖLOGY, during Junior and Senior years, including comparative anatomy, osteology, and embryology ; 149 exercises. Professor Macloskie.

II. COMPARATIVE ANATOMY OF THE VERTEBRATES, during Junior and Senior years ; 94 exercises. Professor Osborn and Mr. Phillips.

III. HISTOLOGY, during second and third terms of Sophomore, Junior and Senior years ; 60 exercises. Professor Libbey.

IV. PALÆONTOLOGY, during Senior year. Professor Scott.

Instruction is also given in the following branches of Natural History :

Physiology, during Senior year ; 35 lectures. Professor Macloskie.

Geology, during Senior year ; 38 lectures. Professor Scott.

Physical Geography, during Junior year ; 40 lectures and recitations. Professor Libbey.

Botany (optional). Professor Macloskie.

## I. ZOÖLOGY.

In this branch, which occupies the second and third terms of Junior year, and continues during the whole of Senior year (two or three recitations weekly), Professor Macloskie gives a series of practical exercises with recitations on the different groups of invertebrate animals, using as type-forms for study, amœba, hydra, planaria, the earth-worm, cray-fish, cockroach, mussel and ascidian; and on comparative physiology, using Huxley's and Foster's text-books, with the actual examination of the structure and functions of the organs. Other text-books used in this course are Huxley's *Anatomy of Invertebrate Animals*, Brook's *Hand-book of Invertebrate Zoölogy*, Huxley on the *Crayfish*, Packard's *Zoölogy*, Mivart on the *Cat*, Flower's *Osteology of the Mammalia*, Parker on the *Shoulder Girdle*, Leidy's *Freshwater Rhizopods of North America*, Balfour's *Comparative Embryology*.

## II. THE COMPARATIVE ANATOMY OF THE VERTEBRATES.

(1) The Birds; their skeleton, muscles, brain, digestive and vascular systems, as modified for their peculiar habits of feeding and flight. This course is given in the first term of Junior year.  
(2) The Mammals; their anatomy studied by inter-comparison and by the light thrown upon it by the anatomy of reptiles, fishes and birds. This course includes the elementary embryology of the chick and frog, also the development of the skull. The course in embryology follows the early chapters of Foster and Balfour's work, and chick embryos are obtained by means of an incubator. The works of Huxley, Balfour and Parker are employed. The principal feature of the course is the laboratory work and the constant practice in drawing from the specimens and dissections.

## III. HISTOLOGY.

This subject embraces a study of the normal tissues, and covers as wide a range as possible in the vertebrate kingdom. Special attention is directed to the methods of microscopical work both in the management of the instrument and in the pro-

cesses of injecting, preserving, staining and mounting specimens, the student being required to perform these operations for himself. The laboratory is open at all hours for private investigation on the part of the student, and material is provided.

The regular exercises are held from 2 to 5 P. M. on Wednesday of each week during the second and third terms of Sophomore, Junior and Senior years. A fee of \$10 is charged to cover the expense of mounting material, slides, cover glasses, etc.

#### IV. PALÆONTOLOGY.

This study extends through the Senior year for those students who elect Biology. It includes practical work in the E. M. Museum, the collections of which offer every facility for the thorough pursuit of this subject. Sufficient undescribed material is in the E. M. Museum to offer those students who desire to take a palæontological subject for their graduation theses abundant opportunity to do so.

#### COURSE IN MATHEMATICS AND MECHANICS.

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The required studies in this elective course are the same as in the course in General Science, but after the beginning of the second term of the Junior year, students electing the course in Mathematics and Mechanics will pursue such of the studies named below, and in such order, as may be determined from time to time by the Professor of Mathematics in the School of Science, the Professor of Mechanics and the Professor of Physics.

Rational Mechanics; Mathematical Theory of Fluid Motions; Mathematical Theory of Strength of Materials; Thermodynamics; Higher Analytical Geometry and Calculus; Quaternions; Method of Least Squares; Graphics.

#### COURSE IN CIVIL ENGINEERING.

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This course is designed to fit its graduates for entering the profession of Civil Engineering. It also provides for the in-

struction, in any of its specialties, of the graduates of this College and others who may be found suitably prepared. The course diverges from that in General Science at the beginning, but not to such an extent as to make it difficult to change, if desirable, from one course to the other before the opening of the Sophomore year.

The requirements for entrance to the Freshman class are the same as in the course for the degree of Bachelor of Science, except that no examination in LATIN is required. The regular course of study occupies four years, and the degree conferred on graduates is that of Civil Engineer, (C. E.)

## STATEMENT OF STUDIES.

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### Studies Pursued in Common with the Classes in General Science.

The instruction in these studies is the same as stated on p. 98, *et seq.*, and under the same instructors. Modern Languages (of the Freshman and Sophomore years); English Literature; Rhetoric; Oratory; Psychology or Logic (according to the election of the student); Political Economy; Mathematics; Descriptive Geometry; Shades, Shadows and Perspective; Free-hand and Mechanical Drawing; General Astronomy; General Chemistry; Mineralogy (of the Freshman and Sophomore years).

### Technical Studies.

The instruction in these studies is given by Professors McMillan, Brackett, Young, Rockwood, Willson, Magie, Smith and McNeill.

In many of the technical studies of the course in Civil Engineering the instruction presupposes a thorough preliminary training of the student in *Mathematics*. A thorough mastery of the ordinary divisions of this science is, therefore, indispensable to the successful study of such subjects as mechanics, physics, etc., which follow it.

Great stress is also laid in this course on the study of *Graphics* as a science, both in its general development and in its application to the practice of designers and builders.

**RATIONAL AND APPLIED MECHANICS and the THEORY OF MACHINES.**—The instruction in these subjects covers a wide field of study, beginning with the general discussion of motions and the action of forces, and ending with the deduction of practical formulas relating to the strength or stability of different structures; the power, efficiency and strength of hydraulic, steam and air motors, and to the various problems which arise in the practice of hydraulic engineers.

In dealing with these subjects, rigidly mathematical treatment is generally used, and higher analysis is freely employed wherever it is expedient; yet proper weight is given to methods of graphic analysis, and the student's attention is especially directed to those problems in which they can be employed with marked advantage.

**EXPERIMENTAL MECHANICS.**—The instruction in this study consists mainly of laboratory work. Its purpose is to familiarize the student with the physical properties of building materials; to teach him by actual experiment how to conduct tests and to deduce therefrom coefficients of strength, elasticity, etc.; how to determine coefficients of hydraulic flow and resistance; and how to gauge, by the aid of indicators and dynamometers, the power of steam and other motors. Under this head come also problems in the erection of structures.

**AN ENGINEERING LABORATORY** has been provided for this work. It contains the following experimental apparatus:—A torsional testing machine; a wire and cement tester; various kinds of current meters and water gauges; a Worthington water meter; a contrivance for determining the hydraulic slopes within earthen retaining banks; a flushing tank; a reaction wheel and other minor pieces of hydraulic apparatus; a double acting steam pump; a locomotive link and valve motion and a ten-horse-power compound engine with condenser, indicators, gauges and a "Prony" brake.



The illustrative apparatus of the laboratory comprises rail sections and joints ; specimens of the products of iron and steel mills and other building materials; a Sturtevant blower ; models of water-wheels, of trestles and of the details of iron bridge and roof joints, of vaults and arches, and a 25-foot iron model of a single track railroad bridge, with a complete outfit of false-works and other appliances for its erection, designed especially for this college.

**THE PLANNING AND CONSTRUCTION OF ENGINEERING WORKS.**—This is treated in a course of lectures following the study of Applied and Experimental Mechanics. The topics which receive special attention are given in the list of subjects under the heading *Constructions*, p. 120.

Great stress is laid on the application of correct principles and formulas ; on the careful inspection, manipulation and preservation of materials, and on the economic features of various designs and the modes of executing them.

A large collection of lantern slides has been provided for illustrating this course. Among the more important photographic studies are a large number of views in detail of the East River Suspension Bridge at different stages of its progress.

An important feature of this part of the course consists of excursions for the examination of rolling mills, bridge works, machine shops, water works, etc. In these visits the class is accompanied by either the Professor or Assistant Professor of the department and every member is required to make full notes of his observations and of the instruction received during the trip.

**PRACTICAL PHYSICS.**—In view of the great importance of the problems of terrestrial magnetism in geodetic surveys, and also in view of the present and increasing demands upon engineers, arising from the application of electricity as a means of illumination and of transmitting energy, provision has been made for the suitable instruction of the student in these subjects, and all candidates for the degree are required to attain a high standard in them.

**GEODESY.**—The study of *Engineering Field Work* is provided for in the different subdivisions of the course in Geodesy. The structure, adjustment and use of each instrument is made the subject of special attention, and no student is allowed to participate in any extended field operation until he has acquired a certain dexterity in handling the instruments used therein. The instruction in field work, beginning with the measurement of lines and angles, extends through different kinds of surveys in the order of their complexity and ends with problems in Higher Geodesy.

A special feature of the course is the stress laid on the collection and verification of field notes by each student, and on their proper use in the preparation of different kinds of plans, maps and charts of surveys. No error is allowed, in field work or in plotting, which is not within the limits observed in current practice.

Under this head is given special instruction in *Hypsometry*, the subject being presented by means of lectures and numerous demonstrations in the lecture room and the field.

A very full collection of instruments has been provided for the course in geodesy. It represents the work of twelve different firms of high repute, great care having been used to avoid the duplication of instruments by the same maker.

The collection consists of a twelve-inch geodesy transit, a large plane-table with telescopic alidade and a telemeter, engineer's, mining and solar transits, Wye and "Dumpy" levels, surveyor's compasses, mercurial and aneroid barometers, sextants, heliotropes, various forms of linear measures, and a large assortment of reconnoitering instruments.

**PRACTICAL ASTRONOMY.**—This is taught in connection with the course in geodesy, and the students become familiar with the most approved methods of determining latitude and longitude, and the true meridian, as well as with astronomical operations in general.

**GEOLOGY.**—This course will occupy two hours a week during the second and third terms of the Junior year, and will be more technical in character than the geological course of the

Academic Department, though covering nearly the same ground. Dynamical, Structural and Historical Geology will be treated, but special attention will be given to Structural Geology, including Petrography, with reference to its technical and economical bearings.

The text-book employed will be Geikie's Manual of Geology.

**TOPOGRAPHICAL DRAWING.**—The object of this course is to make the student expert in the execution, in pen work and colors, of finished plans and maps of various kinds of surveys. Except in the necessary preliminary drill, the drawings invariably represent actual surveys made by the different classes. A rigid adherence to the field notes of each survey and a high degree of finish is required in the execution of these drawings.

**GRAPHICS.**—The instruction in Graphics includes the following branches :

*Structure Drawing.* A drawing of plan, elevation, end view, sections and details of some railroad bridge, or other structure of approved modern type, to scale, from measurements.

*Machine Construction and Drawing.* A course of lectures, recitations and practical exercises on the kinematics of machinery, with graphical representation of mechanical movements ; theory of link and valve motion ; screw propulsion ; gearing, including the theory and use of Willis' and Robinson's odontographs ; working and finished drawings of machinery, etc.

Text-books and reference works :

Weisbach.... <i>Kinematics and Machinery of Transmission.</i>	Warren..... <i>Machine Drawing.</i>
Reuleaux..... <i>Kinematics of Machinery.</i>	Unwin..... <i>Machine Design.</i>
MacCord..... <i>Kinematics of Mechanical Movements.</i>	Goodeve..... <i>Elements of Mechanism.</i>
Anchincloss..... <i>Link and Valve Motion.</i>	Forney..... <i>Catechism of Locomotive.</i>
Stahl and Woods... <i>Elementary Mechanism.</i>	Zeuner ..... <i>Treatise on Valve Gears.</i>
	Sennett..... <i>Marine Steam Engine.</i>
	Seaton.... <i>Manual of Marine Engineering.</i>

*Stereotomy.* A course on the application of descriptive geometry to stone-cutting, practically applied by the student in cutting a voussoir of plaster to given shape by means of templates, patterns, etc., derived from his own drawings. Text-book, Warren's Stone-Cutting.

**THESIS.**—Every Candidate for the degree of Civil Engineer is required to prepare and submit to the approval of the Professor of Civil Engineering, a design for, or a review of some special machine, structure, or process as a graduation thesis.

## SYNOPSIS OF COURSE.

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### FRESHMAN YEAR.

#### *First Term.*

MATHEMATICS, ENGLISH, MODERN LANGUAGES, MECHANICAL AND FREE-HAND DRAWING, as in the course in General Science. GEODESY: *The Measurement of Lines*; with common chains and tapes; with city surveyors' chains, tapes and rods; Chain surveys and computation of areas. *The Measurement of Angles*; with different kinds of compasses; Chain and compass surveying, including the simpler methods of determining the true meridian and magnetic declination. Theory and practice; [80].

#### *Second Term.*

MATHEMATICS, ENGLISH, MODERN LANGUAGES, PLANE PROBLEMS, DESCRIPTIVE GEOMETRY and MINERALOGY, as in the course in General Science.

#### *Third Term.*

MATHEMATICS, ENGLISH, MODERN LANGUAGES and MINERALOGY, as in the course in General Science. TOPOGRAPHICAL DRAWING: Drawings representing the conventional symbols separately and in combination; Lettering; [35].

### SOPHOMORE YEAR.

#### *First Term.*

MATHEMATICS, DESCRIPTIVE GEOMETRY, CHEMISTRY, MINERALOGY, ENGLISH, MODERN LANGUAGES, as in the course in General Science. TOPOGRAPHICAL DRAWING: The plotting of maps; Map of the farm survey begun; [33].

*Second Term.*

**MATHEMATICS, CHEMISTRY, ENGLISH, MODERN LANGUAGES**, as in the course in General Science. **STEREOTOMY**: Structure Drawing; [20]. **GEODESY**: Problems in the partition of lands; surveys of public lands; Structure and adjustment of engineers' field instruments; [15]. **TOPOGRAPHICAL DRAWING**: Map of the farm survey finished; [14].

*Third Term.*

**MATHEMATICS, CHEMISTRY, ENGLISH, MODERN LANGUAGES**, as in the course in General Science. **GEODESY**: The measurement of angles with transits and theodolites; The computation of lines and angles from the field notes of triangulations; Leveling for bench marks, profiles and cross sections; Topographical surveying. Theory and practice; [28]. **TOPOGRAPHICAL DRAWING**: Contour maps; drawings of profiles and cross sections; [16]. **STEREOTOMY**: Structure drawing; [18]. Shades, shadows, perspective and spherical projections; [21].

**JUNIOR YEAR.***First Term.*

**MATHEMATICS, PHYSICS, ENGLISH, PSYCHOLOGY**, as in the course in General Science. **GEODESY**: Measurement of heights with barometer and thermometer; Hydrography; Surveying with the stadia and gradienter; Solar compass; Town, plane-table and mine surveying. Theory and practice; [60].

*Second and Third Terms.*

**PHYSICS, ENGLISH, LOGIC or PSYCHOLOGY**, as in the course in General Science. **MECHANICS**: Analytical Mechanics of solids and fluids; [76]. **GEODESY**: Preliminary and location surveys of routes; Staking out for construction. Theory and practice; [30]. **TOPOGRAPHICAL DRAWING**: Hydrographic charts; Town maps; Plans and profiles of mines; Colored topography; Maps of landscape surveys; [72]. **GEOLOGY**; [38].

**SENIOR YEAR.***First Term.*

**GENERAL ASTRONOMY**, as in the course in General Science. **APPLIED MECHANICS**: Elasticity and strength of materials; Theory of stresses in roofs and bridges; [90]. **STEREOTOMY**: Machine construction and drawing [28]; Stone cutting, theory and plates; [24]. **PRACTICAL ASTRONOMY**, as in Elective course of Academic Department; [15].

*Second and Third Terms.*

**GENERAL ASTRONOMY**, as in the course in General Science. **APPLIED MECHANICS**: Stability of walls and arches; Practical hydraulics; [49]. **MACHINES**: General theory; Hydraulic motors; Theory of steam and air engines; [60]. **CONSTRUCTIONS**: Materials of structures; Dressing and preservation of materials; Foundations; Details of roofs and bridges; Construction of roads, railroads, canals and tunnels; Water supply and drainage; Heating and ventilation; [80]. **TOPOGRAPHICAL DRAWING**: Preliminary and final drawings of routes; [25]. **GEODESY**: Higher geodesy; [15]. **PRACTICAL ASTRONOMY**, as in elective course of Academic Department; [15]. **PRACTICAL PHYSICS**: Advanced study of terrestrial magnetism and electrodynamics; [30].

**NOTE.**—It will be noticed that the above list of studies does not provide for regular instruction in the Modern Languages after the Sophomore year. It is, therefore, necessary to explain that a partial equivalent for such instruction has been provided by the use of French and German books of reference in some of the technical courses of the Junior and Senior years.

## EXAMINATIONS, STANDING AND GRADUATION.

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### EXAMINATIONS.

Regular Examinations ordinarily take place at the end of a term; each class being examined in the studies of the term. Occasionally, when a course of study is finished before the close of a term, the examination takes place when that study is completed; but such examinations are not allowed to interfere with the regular exercises in other studies.

Examinations are for the most part conducted in writing, but in certain subjects are wholly or partly oral. Private examinations are not allowed except in extreme cases, and by special permission of the Faculty. Absence from an examination, except for reasons of absolute necessity, will be regarded as a serious delinquency, and a subsequent examination will not be granted except by a vote of the Faculty.

#### *Regulations Concerning the Removal of Conditions.*

The minimum mark for passing examinations is sixty in every department, the maximum mark being one hundred.

A student whose mark is below fifty in more than two subjects, involving at least forty per cent. of the work of the term, is dropped from his class.

Other students who, during the first or second terms, have been conditioned, shall, if so required by their instructors in the departments in which they have failed, take tutors to be approved by the Faculty, and will have one opportunity for the removal of each condition, not later than the third Saturday of the term succeeding that in which they were conditioned. Of the students who are still found deficient, only those who have shown great industry during the term in which the re-examinations were held, and who, in the opinion of the Faculty, are

able to keep up with their respective classes, may be allowed to continue with the same, the period of probation to be determined by the Faculty in each case. The second examination, held at the end of this period, will be final in its results. Students who have been absent for reasons of absolute necessity from one or more examinations in any term will be examined on or before the second Saturday of the following term. Application for such examination, with reasons for absence, must be made on or before the first Monday of the term. .

All conditions standing against a student at the end of the college year must be removed within the week after the opening of the next term. Failing to remove such conditions, the student will be required at once to join the next lower class.

### **STANDING.**

The results of the term examinations are combined with those of the recitations to decide the relative standing or rank of the student during the term. In computing ranks, each study, elective or required, is estimated relatively to the others according to the number of hours which it occupies in the weekly schedule of lectures and recitations. The conduct of the student and his attendance also affect his standing. The maximum mark in each department is one hundred; the minimum, or passing mark, is sixty. A student whose average, as determined by the combination of his examination and recitation marks, falls below sixty, is conditioned, and in order to continue with his class must be re-examined. A report of the standing of each student is made to his parent or guardian by the Registrar of the College at the close of the first term and at the end of the year. The last report gives the student's standing for the year.

The final rank of a student is calculated from all the marks received by the student during his College course.

### **GRADUATION.**

Students who have fulfilled the requirements of the undergraduate courses, passing satisfactory examinations in all their studies and presenting acceptable graduation theses, are or-



dinarily recommended by the Faculty for the degree attached to the course they have pursued, and if the recommendation is approved by the Trustees they receive diplomas signed by the President and the Clerk of the Board of Trustees.

The graduation thesis must be finished by the second Saturday before Commencement (*i. e.* June 11, 1887) and will be publicly read and defended by the student during Commencement week.

# GRADUATE COURSES

## IN THE

### ACADEMIC AND SCIENTIFIC DEPARTMENTS.

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Provision has been made for courses of instruction open to resident graduates of this and other Colleges, under the following regulations:

Every instructor in the College shall be at liberty, with the leave of the Faculty, to give instruction to graduates. He shall meet with his class for at least one hour a week, and not more than three hours a week, during the Academic year, and shall require the members of his class to undergo rigid examinations on the course pursued.

Each graduate student attending instruction regularly, and passing the examinations, is entitled to a certificate stating what he has done, signed by the President in behalf of the College.

Students by pursuing these courses may also qualify themselves for the degrees, Master of Science, Doctor of Science, or Doctor of Philosophy, according to the regulations prescribed under the heading *Doctor's and Master's Degrees*.

Each graduate student shall pay ten dollars or such sum as the Faculty may require for every course of instruction that he enters requiring an hour per week, and shall defray whatever expense may be incurred by the use of instruments and materials employed by him. This charge may be remitted in whole or part where the circumstances of the student require it. All undergraduate courses of lectures or instruction are also open to graduate students without the payment of any fees except for material used.

Arrangements for the graduate courses should be made by application to the individual instructors.

Graduate courses in the following subjects are announced for the present year : Contemporary Philosophy, English Ethics, Plato and his Philosophy, Modern Philosophy, History, Common Law, Latin, Pedagogics, Assyrian Archæology, Homeric Archæology, English, Sanskrit, Physics, Higher Mathematics, Theoretical Astronomy and Biology.

Opportunity is also offered to graduates for work in the following subjects, in connection with the regular undergraduate courses : Anglo-Saxon, English Literature, Psychology, History of Philosophy, Metaphysics, History of Art, Geology, Mineralogy, Biology, Physics, Practical Astronomy, Analytical and Applied Chemistry, Assaying, Topography.

## GRADUATE COURSES.

### Discussions in Contemporary Philosophy.

This class meets once a week and is conducted by the President, who after every two lectures presides at a discussion. The principal speculative questions of the day, those which raise up doubt and difficulties in young minds, are taken up. No. I of Dr. McCosh's *Philosophic Series: On the Criteria of Diverse Kinds of Truth*, is used, not so much as a text-book as a guiding thread in the lectures and discussions. He treats of the theories of Knowledge, including Realism, Idealism and Agnosticism, and gives the tests of every kind of truth ; (1) of First Truths : self-evidence, necessity and universality ; (2) of Reasoned Truths : the syllogism, with an explanation of the joint dogmatic and deductive method ; (3) of the Inductive Method, with its canons ; (4) of the Joint Inductive and Deductive Method. He applies the principles thus derived first to physics, and inquires what is the nature of, and what are the limits to development, and secondly to ethics and religion, inquiring what is the character of our world, optimist, pessimist, meliorist, or what?

### History of English Ethics.

One lecture a week by Professor Patton during the second term. The lectures in this course will trace the history of eth-

ical thought in Great Britain from Hobbes to Mill. They will be critical and expository, exhibiting the leading features of representative systems, comparing different schools of thought with each other, and showing the relation they sustain to contemporary ethical discussion.

### **Plato and His Philosophy.**

This course, conducted by Professor Orris, is on the writings and Philosophy of Plato, as follows: Plato's Republic, alternating with his Theætetus; Analysis of his higher dialogues; Lectures and dictation on his philosophy and teachings; Instruction in the language.

### **Readings in Modern Philosophy.**

Professor Ormond devotes one exercise a week to Readings in Modern Philosophy. Selections are made from the works of Descartes, Locke, Hume, Kant, Hamilton, Spencer, etc. The readings are accompanied with exposition and criticism.

### **History.**

Professor Sloane conducts one exercise a week throughout the first and second terms. Subject: Historical Methods and Historical Systems.

### **English Common Law.**

Professor Johnston gives a course of lectures, one hour a week throughout the second and third terms, on the English Common Law, using the first and third books of Blackstone's Commentaries on the Laws of England as a text-book. Any edition of Blackstone may be used, but Cooley's is recommended.

### **Latin.**

Professor Packard reads with a graduate class, selections from the following Latin works: Cicero's philosophical writings, Seneca's Moral Epistles, Tertullian and Augustine; or Early Sources of Roman Law.

### **Pedagogics.**

A graduate course is offered by Professor West in Pedagogics during the first and second terms. It consists of the study of leading educational works and systems and of the theory of education. A thesis is required in addition to the examination at the close.

### **Assyrian Archæology.**

Professor Frothingham delivers one lecture weekly during the first term, on Babylonian and Assyrian Archæology. This course includes not only the study of the fine arts, literature and ethnography, but also a review of the rise and development of the science of Assyriology, of the discoveries in philology and archæology.

### **Homeric Archæology.**

Professor Marquand conducts a course of readings in Homer's Iliad, with special reference to its mythological and archæological content, as illustrated by recent discoveries. One exercise a week during the first and second terms.

### **English Language.**

A graduate course will be offered in second term by Professor Hunt. The epic Beowulf will be the subject.

### **Sanskrit.**

Graduate students may begin Sanskrit with the Senior elective class, or continue studies already begun. For outline of course see p. 67.

### **Physics.**

These courses afford opportunity for advanced work in the laboratory and for the study of Theoretical Physics. In the laboratory the student is either conducted through courses covering general topics, such as Heat, Optics, or Electricity, which are similar to the courses of the Senior year, but more extended

and exhaustive in their character; or, if he so desires, is encouraged to undertake for himself the investigation of special topics. In the theoretical courses the student reads, for a general survey of the subject of Mathematical Physics, some standard text-book such as Jamin and Bouty's *Traité de Physique*, and for the mathematical theory of the particular subject he is working upon, special treatises, such as Fourier's *Analytical Theory of Heat*, Verdet's *Théorie Mécanique de la Chaleur*, Verdet's *Leçons d'Optique Physique*, Mascart and Joubert's *Electricity and Magnetism*, Maxwell's *Electricity and Magnetism*, Kirchhoff's *Mechanik*, etc. Professors Brackett and Magie conduct these courses.

### Higher Mathematics.

The graduate courses this year are in Differential Equations, in the Theory of Functions and in Higher Algebraic Curves and Surfaces. They are based on the treatises of Forsyth and Boole, Hermite and Clebsch and Gordan, and Salmon and Clebsch, respectively. Professor Fine conducts these courses.

### Astronomy.

This course is conducted by Professors Young and McNeill. It consists of:

(a) Practical Astronomy—the same as in the Senior elective, previously described in the course of study of the Academic Department. This is open to such graduates as did not take it in their College course.

(b) Theoretical Astronomy—one hour weekly through the year. This course consists in the reading of Watson's *Theoretical Astronomy*, supplemented by selections from Oppolzer and Klinkerfues, and includes the calculation of the orbit of a planet or comet from actual observation.

### Biology.

A thorough advanced course in Biology has been established in connection with the Geological, Zoölogical, Botanical, and Chemical department, the objects in view being (1) to foster

a spirit of original research, (2) to qualify advanced students to become teachers. This course is open to College graduates, also to students presenting diplomas from recognized medical schools.

It is open also to students who are not qualified to become candidates for a degree, but who possess sufficient elementary knowledge to profit by the instruction.

The following subjects of instruction are arranged for:

Professor Macloskie—I. Anatomy and Embryology of the Higher Invertebrates. II. Vegetable Morphology and Histology.

Professor Cornwall—Physiological Chemistry.

Professor Libbey—I. The Microscope and Microscopic Technology. II. Histology. III. Deep Sea Soundings and Dredging; recent methods and results.

Professor Osborn—I. Comparative Anatomy of the Vertebrates. II. Elements of Embryology.

Professor Scott—I. Vertebrate and Invertebrate Palæontology. II. Advanced Embryology.

These courses are of a comprehensive and elastic character, and according to the requirements and wishes of different students, include much laboratory work under the direction of the instructor. At the close of the first term, the student may select a department of special study for his thesis, which must present the results of original work. If the student pass all his examinations at the close of the year and his thesis be satisfactory to the board of Instructors, he will be entitled to the degree of Master of Science (M. S.) For the degree of Doctor of Science which is awarded after a two years' course, see heading, *Doctor's and Master's Degrees*. Attached to the diploma will be a statement that the degree has been awarded for proficiency in Biology.

# THE COLLEGE OF NEW JERSEY.

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The College originated by Royal Charter under President Dickinson in 1746. A second more ample charter was granted in 1748. After the war of the Revolution, the charter was confirmed and renewed by the Legislature of New Jersey.

The College embraces a Board of Trustees and a Faculty of Instruction with certain additional officers employed in the administration of affairs. The undergraduate Societies and Alumni Associations, though not strictly parts of the organization of the College, are fostered by it, and coöperate with it.

The Corporation is styled "The Trustees of the College of New Jersey." By its charter it holds and administers the property of the College, appoints the President and Faculty, makes laws for the government of the Institution, and confers the degrees. The Board is a self-perpetuating body, composed of twenty-seven members, with the Governor of the State as President *ex officio*, or, in his absence, the President of the College.

The Faculty, consisting of the President, the Professors and Tutors, conducts the instruction and discipline of the College, aided by Instructors and Lecturers.

## ALUMNI ASSOCIATIONS.

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### ALUMNI ASSOCIATION OF NASSAU HALL.

Founded 1826.

1st President—His Excellency JAMES MADISON, LL.D., of the Class of 1771, President of the United States.

*President.*

JOHN MACLEAN,\* D.D., LL.D., '16, Ex-President of Princeton College.

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\* Deceased August 10th, 1886.



*Vice-Presidents.*

HARVEY LINDSLY, M.D., LL.D., '20, . . of the Washington Ass'n.	
Hon. BENJ. HARRIS BREWSTER, LL.D., '84, Philadelphia	"
Hon. JOHN S. HAGER, LL.D., '36 . . . . . San Francisco	"
Col. JAS. W. ABERT, LL.D., '38 . . . . . Cincinnati	"
Hon. JOHN T. NIXON, LL.D., '41 . . . . . New Jersey	"
Prof. J. D. PICKETT, Ph. D., '41 . . . . . Kentucky	"
WM. C. PRIME, LL.D., '43 . . . . . New York	"
WALTER MANN, Esq., '45 . . . . . Minnesota	"
Hon. S. MILLER BRECKINRIDGE, LL.D., '47 . . St. Louis	"
Rev. FRANK K. HODGE, D.D., '59 . . North East Penn'a	"
JOHN K. COWEN, Esq., '66 . . . . . Maryland	"
Hon. J. BAYARD MCPHERSON, '66 . . . . . Central Penn.	"
SPENCER TRASK, Esq., '66 . . . . . Long Island	"
JAMES LAUGHLIN, Jr., Esq., '68 . . . . . Pittsburgh	"
Rev. S. J. MCPHERSON, D.D., '74 . . . . . Chicago	"
Rev. THOMAS C. HALL, '79 . . . . . Omaha	"

*Secretaries.*

Prof. JOHN T. DUFFIELD, D.D., '41.

Prof. HENRY C. CAMERON. D.D., Ph. D., '47.

Meets for business in the Old Chapel at 1 P. M., on Tuesday of Commencement week, after which the procession of Trustees, Faculty, Alumni and invited guests is formed in front of Nassau Hall, and proceeds to University Hall for the Alumni Dinner. Membership includes all graduates, professors and trustees of Princeton College.

**PRINCETON ALUMNI ASSOCIATION OF NEW YORK AND VICINITY.**

Founded 1866.

*President.*

JAMES W. ALEXANDER, '60.

*Vice-Presidents.*

Hon. ROBERT STOCKTON GREEN, '50.

JOHN L. CADWALADER, '56.

J. COLEMAN DRAYTON, '73.

*Secretary.*

RUDOLPH E. SCHIRMER, '80, 85 Union Square.

*Treasurer.*

CORNELIUS C. CUYLER, '79.

Annual meeting in May.

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**PRINCETON ALUMNI ASSOCIATION OF PHILADELPHIA AND VICINITY.**

Founded 1868.

*President.*

HON. BENJ. HARRIS BREWSTER, LL.D., '84.

*Vice-Presidents.*

HON. JAMES POLLOCK, '31.

HON. FURMAN SHEPPARD, '45.

HON. CRAIG BIDDLE, '41.

*Secretary.*

GEORGE R. VANDUSEN, '77, 6th and Locust Sts.

*Treasurer.*

JOSIAH R. ADAMS, '78.

Annual Meeting, second Tuesday in December.

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**ALUMNI ASSOCIATION OF THE COLLEGE OF NEW JERSEY,  
FOR THE DISTRICT OF COLUMBIA AND THE  
SOUTHERN STATES.**

Founded 1872.

*President,*

HARVEY LINDSLY, M.D., LL.D., '20.

*Secretary.*

JOHN H. VOORHEES, Esq., '41, cor. 9th and F Sts.,  
Washington, D. C.

*Treasurer.*

A. B. KELLY, Esq., '70.

Annual Meeting, third Thursday in January.

**PRINCETON ALUMNI ASSOCIATION FOR THE NORTHWEST.**

*President.*

**JEREMIAH LEAMING, '58.**

*Secretary and Treasurer.*

**JOHN B. SKINNER, '81, Chicago, Ill.**

**Meets in November or December, as appointed by Executive Committee.**

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**PRINCETON ALUMNI ASSOCIATION OF WESTERN PENNSYLVANIA.**

*President.*

**JAMES LAUGHLIN, JR., '68.**

*Secretary.*

**WILLIAM W. LAWRENCE, '78, Pittsburgh, Pa.**

*Treasurer.*

**GEORGE A. HOWE, '78.**

**Annual Meeting, last Tuesday in August.**

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**PRINCETON ALUMNI ASSOCIATION OF CINCINNATI.**

**Founded 1878.**

*President.*

**COL. JAMES W. ABERT, '88.**

*Secretary.*

**EDWARD H. ERNST, '82, Covington, Ky.**

*Treasurer.*

**P. A. REECE, Esq., '75.**

**Annual Meeting, second week in April.**

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**PRINCETON ALUMNI ASSOCIATION OF ST. LOUIS.**

*President.*

**HON. S. M. BRECKINRIDGE, LL.D., '45.**

*Vice-President.*

DABNEY CARR, Esq., '52.

*Secretary and Treasurer.*

K. D. MELLIER, '69, 709 Washington Avenue, St. Louis.

Annual Meeting, in April.

PRINCETON COLLEGE ALUMNI ASSOCIATION OF THE PACIFIC  
COAST.*President.*

REV. A. WILLIAMS, '29.

*Secretary.*

REV. FREDERICK E. SHEARER, '62, San Francisco, Cal.

Meets annually.

## PRINCETON ALUMNI ASSOCIATION OF OMAHA.

Founded 1884.

*President.*

PROF. C. M. DES ISLETS, '68.

*Secretary.**Treasurer.*

LEONIDAS P. FUNKHAUSER, '78.

Annual Meeting, in April.

## PRINCETON ALUMNI ASSOCIATION OF LOUISVILLE, KY.

*President.*

THOMAS D. DAVIDSON, Ph.D., '48.

*Secretary.*

PROF. JOHN G. CECIL, '76.

*Treasurer.*

CLIFTON RODES BARRET, '81.

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PRINCETON ALUMNI ASSOCIATION OF NORTHWESTERN  
PENNSYLVANIA.

*President.*

JAMES D. STRAWBRIDGE, M.D., '44.

*Secretary.*

SOLOMON S. SCHULTZ, M.D., '52, Danville, Pa.

*Treasurer.*

REV. ALEXANDER HENRY, '70.

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THE PRINCETON ALUMNI ASSOCIATION OF LONG ISLAND.

*President.*

REV. HENRY J. VANDYKE, JR., D.D., '78.

*Vice-President.*

REV. JAMES H. DARLINGTON, PH.D.

*Secretary.*

REV. N. WOOLSEY WELLS, '72.

*Treasurer.*

PROF. WILLIAM J. NEVIUS, '29.

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PRINCETON ALUMNI ASSOCIATION OF MARYLAND.

Founded 1885.

*President.*

JOHN K. COWEN, Esq., '66.

*Secretary.*

LAWRASON RIGGS, JR., '88, Baltimore, Md.

*Treasurer.*

CHARLES J. BEASTEN, '61.

**Annual Meeting, in January.**

## ALUMNI ASSOCIATION OF NEW JERSEY.

Founded 1886.

*President.*

HON. EDWARD W. SCUDDER, '41.

*Secretary.*

CHARLES HEWITT, '83, Trenton, N. J.

*Treasurer.*

F. D. COOK, '76.

## ALUMNI ASSOCIATION OF THE NEW NORTHWEST.

*President.*

GEN. GEORGE B. HALSTED, '39.

*Secretary and Treasurer.*

W. W. CONNER, '85, St. Paul, Minn.

## DOCTOR'S AND MASTER'S DEGREES.

## MASTER OF ARTS.

The degree of A.M. is conferred, three years after graduation, upon any Bachelor of Arts who is pursuing one of the learned professions (including teaching), or who, on or before May 1st of the year in which he seeks the degree, shall have submitted to a committee appointed by the Board of Trustees, a satisfactory paper, literary, philosophical or scientific.

The same degree may be conferred, two years after graduation, upon any Bachelor of Arts who shall have devoted one of the years exclusively to study in the College under the care of the Faculty, passing rigid examinations upon the studies pursued; or who shall have taken at least one graduate course each year for the two years and passed satisfactory examinations upon his work.

**MASTER OF SCIENCE.**

Bachelors of Science who shall have devoted one year in this College exclusively to the study of such of the following subjects as the Faculty shall prescribe, and who shall have shown satisfactory proficiency therein by dissertations and examinations, may apply for the degree of Master of Science (M. S.) The prescribed subjects are:—*Biology, Mathematics, Rational and Applied Mechanics, Practical Astronomy, Applied Chemistry, Qualitative Analysis, Quantitative Analysis, Physics, Mineralogy, Drawing, Modern Languages.*

Any Bachelor of Arts, who after examination may be found to be prepared to pursue a graduate course in Science, may become a candidate for the Degree of Master of Science on the same condition as a Bachelor of Science.

**DOCTOR OF PHILOSOPHY.**

A Bachelor of Arts who has pursued a course of prescribed study for two years—one of which must be spent in Princeton in the exclusive study of subjects in the Department of Philosophy—and has passed a rigid examination on subjects studied and presented a thesis giving evidence of original research and high attainment, may apply for the degree of Doctor of Philosophy (Ph.D.)

**DOCTOR OF SCIENCE.**

A Bachelor of Arts or of Science, who has devoted all his time to a two years graduate course of scientific studies in the College, passed rigid examinations on the subjects studied and presented a thesis containing the results of original research, may apply for the degree of Doctor of Science (D.Sc.)

**DOCTOR OF LITERATURE.**

The Degree of Doctor of Literature (Litt.D.) may be bestowed on a Bachelor of Arts, who has devoted two years to the study of Literature, ancient and modern, one year of which has been spent in Princeton.

SPECIAL REGULATIONS IN REGARD TO THE DEGREES OF  
PH.D., D.SC., AND LITT.D.

The Degrees of Ph.D., D.Sc. and Litt.D., may be conferred on graduates of the College, who, without residence in Princeton, have pursued a three years' course of study under a Committee of the Faculty appointed for the purpose, it being understood that they come up from time to time to be examined, or if required, to pursue certain studies.

Graduates of Colleges other than Princeton, may, by special permission of the Standing Committees on Degrees, be allowed to pursue under superintendence a prescribed course of study in order to gain any one of the above specified degrees.

BACHELOR OF DIVINITY.

The Degree of Bachelor of Divinity (B.D.) may be bestowed on graduates of Theological Seminaries who have pursued for two years a course of study prescribed by examiners appointed by the Board of Trustees and have been examined periodically by these Examiners—one year of the two having been spent in Princeton. This degree may also be bestowed on the graduates of Theological Seminaries, who, without residence, have devoted three years to theological studies under the superintendence of examiners appointed by the Board of Trustees.

FEES FOR DEGREES REQUIRING EXAMINATION.

In order to meet the expense of examinations, those who apply for degrees requiring examinations, shall pay a fee of forty dollars upon their first application, twenty dollars each year thereafter, and fifty dollars when the degree is conferred.

HONORARY DEGREES.

The Degrees of Doctor of Divinity (D.D.) and Doctor of Laws (LL.D.) are conferred solely *honoris causa*; the other degrees above named, excepting only the degree of A.B., are, also, sometimes conferred in the same manner.



## FELLOWSHIPS, COMPETITIVE SCHOLARSHIPS AND PRIZES.

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Besides the degrees and honors conferred in the regular course, annual fellowships, competitive scholarships and prizes\* are offered as special incentives to study, in the classes or departments with which they are connected.

Only matriculated students who are candidates for a degree are admitted to the competition for fellowships, prizes and scholarships, and no one is admitted to such competition who has failed to pass satisfactorily his last preceding examination in any of the departments.

No member of any class is allowed to compete for more than one of the fellowships or scholarships offered to that class.

The names of the fellows, scholars and prizemen of each year are included in the Honor List for the year.

The funds for fellowships, prizes and competitive scholarships are special gifts, and the income is appropriated according to the specific instructions of the donor. They do not belong to the general funds of the College. If, therefore, there be default in the interest on the securities in which these funds are invested, the college assumes no pecuniary responsibility in the matter.

### FELLOWSHIPS.

Every competitor must have been a member of the College in full standing for at least two Academic years previous to the fellowship examinations.

No student whose final rank for scholarship is below the third general group can be a competitor for any fellowship; and no student can be a competitor for the fellowship of any

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\*For Endowed Scholarships see page 161.

particular department whose average rank for the last two years of his course is below the second group in that department.

Every fellow obtaining any one of the \$600 fellowships must devote his whole time for one year to study in the department for which the fellowship is provided, under the direction of the Professors in that department. He must reside in Princeton, and pass two rigid examinations on his work, unless by a vote of the Faculty he be allowed to study at an approved foreign University, in which case he shall from time to time furnish written reports of his work to the Professors in his department. The result of every examination and the reports of work done abroad shall be immediately reported to the Faculty. If resident in Princeton, he shall be allowed to occupy free of cost in one of the College buildings a room assigned to him by the College authorities. He shall be regarded, while occupying such place, as a resident officer of the College, and shall perform such duties in preserving order and decorum in the College edifices as the President and Dean shall assign. He shall also, when called on, perform such duties in the department to which he belongs as may be assigned to him by the President at the request of the Professors in that department.

#### THE CHANCELLOR GREEN MENTAL SCIENCE FELLOWSHIP.

This Fellowship, originally founded in 1870 upon the annual payment of \$600 by the late Chancellor Henry W. Green, was permanently endowed in 1878 by a gift of \$10,000 by his widow.

The income of this fund, to be paid quarterly, will be awarded to that member of the Senior class who shall write the best essay on *Theories of Knowledge, with an examination of Realism, Idealism and Agnosticism* (to be given in on or before June 1), and who shall stand highest at a special examination to be held in June, on the following subjects :

A general knowledge of the philosophies of Plato, Aristotle, Descartes, Locke, Leibnitz, Hume, Kant and Hamilton. Cicero *De Officiis*, Book III., *De Contentione Honesti et Utilis*. Theoretical Ethics, Psychology and Metaphysics (McCosh's *Intuitions*, Parts I., II., III., Book 1). The Syllogism, and Induction.

## THE CLASSICAL FELLOWSHIP.

The Classical Fellowship has been, for a time, without funds. The sum of \$600, payable quarterly, was previously awarded to its successful competitor. A portion of that sum, and possibly the full amount, will be awarded to that member of the Senior class who shall stand highest at a special examination, to be held in June, 1887, on the following subjects :

## IN GREEK.

Translation from English into Greek. Translation of Prose Greek at sight. The *Alcestis* of Euripides, Aristophanes' *Knights*, Plato's *Charmides* and *Lysis*. The Philosophy of Plato.

## IN LATIN.

Translation from English into Latin. Translation of Latin at sight. Cicero *De Natura Deorum*, and The Relations of Roman Philosophy to Roman Religion. History of Latin Literature.

## THE CLASS OF 1860 EXPERIMENTAL SCIENCE FELLOWSHIP.

This Fellowship was founded in 1870 upon the sum of \$10,000 subscribed by the Class of 1860. A deficiency of income, resulting from the depreciation of the value of the securities in which the principal was invested and the lowering of the rate of interest, is paid, by the consent of the donor, from the income of the Magee Professorship of Mining and Engineering, founded by George J. Magee, Esq., of the Class of 1860.

The sum of \$600, to be paid quarterly, will be awarded to that member of the Senior class who shall stand highest at a special examination, to be held in June, on the following subjects, viz : 1. The Theory of Electricity. 2. (a.) The Geology of Coal, Oil and Gas. (b.) The History of Mammals and Birds. 3. Iron and Steel.

## THE J. S. K. MATHEMATICAL FELLOWSHIP.

The J. S. K. Fund was established in 1873 upon the sum of \$11,000, given by a gentleman in New York, \$600 of the income of which is devoted to this Fellowship, and \$200 to the Freshman First Honor Prize.

This sum of \$600, to be paid quarterly, will be awarded to that member of the Senior class who shall stand highest at a special examination to be held in June, on the following subjects: Analytical Geometry ; Differential and Integral Calculus.

#### THE BOUDINOT FELLOWSHIPS.

These Fellowships are founded upon a bequest of the late Dr. Elias Boudinot, of New Jersey, and yield each the annual sum of \$250.

**THE HISTORICAL FELLOWSHIP.**—The sum of \$250, to be paid quarterly, will be awarded to that member of the Senior class who shall write the best essay on *The Dissolution of the Whig Party*, and pass the best examination in June next on The Relations between the General Government and the Bank of the United States. The essay to be presented on or before June 1.

The general subject of examination in 1888 will be The Embargo System: its Origin and History and the Federalist Opposition to it. The essay will be on *The Influence of the Theory of the Social Contract on the American Revolution*.

The Fellow shall from time to time during the following year, as may be required by the Professor of History, give evidence by written papers that he is pursuing an approved course of historical investigation.

**THE MODERN LANGUAGE FELLOWSHIP.**—The sum of \$250, to be paid quarterly, shall be awarded to that member of the Senior class who shall pass the best examination in June, on the following subjects :

A comprehensive knowledge of the French and the German descriptive grammars. Also, the origin and historical development of these languages. In Literature—The mediæval epics of France and Germany, with the sources of their inspiration. Moreover, their lyrical poetry and its representatives ; the leaders of the classical drama in France in the 17th century ; the current of thought in the 18th century—its exponents and results. A comparative view of Germany's intellectual state before and after the Reformation. Significance of the "Sturm und Drang" Period with its chief participants. The current of

thought in Germany from the time of her mental emancipation from foreign influences to the present day. Reading at sight of any given author of the classical or the recent period. An essay of not less than four pages (foolscap) in one of these languages. The examination will be conducted both orally and in writing.

The Fellow shall from time to time during the following year, as may be required by the Professor of Modern Languages, give evidence by written papers that he is reading such a course as the Professor may approve.

#### THE E. M. BIOLOGICAL FELLOWSHIP.

The Biological Fellowship will be awarded to that student who shall stand highest at a competitive examination on subjects assigned by the Professors of the Biological department.

The competition for this fellowship will be open to any member of the Senior class in either the Academic or Scientific department, or to any college graduate who shall have pursued during the preceding year, the graduate course in Biology at Princeton, and who shall, in the opinion of the examiners, be deemed competent to pursue the subject advantageously.

This fellowship conveys the use of a table in the National Seaside Laboratory at Wood's Holl, Mass., together with all the facilities afforded for the collection and study of animal life during the season favorable for such investigations. In the winter months following this laboratory work the Fellow will pursue his studies at Princeton, and will be required to prepare and submit a thesis embodying the results of his summer researches.

The examinations for this Fellowship in 1887 will be held in June upon the following subjects :

1. *The Structure of the Vascular Cryptograms and Bryophytes.*
2. *The Anatomy and Embryology of the Worms.*
3. *The Structure and Development of the Vertebrate Nervous System.* (Huxley's Anatomy of the Vertebrates and Balfour's Comparative Embryology.)
4. *The Histology of the Digestive Tract.*

**PRIZES AND COMPETITIVE SCHOLARSHIPS.****ALEXANDER GUTHRIE McCOSH PRIZE.**

The interest of \$1,000 will be given to that member of the graduating class who shall be adjudged by the Professors of Mental and Moral Science to have written the best thesis on Mental Philosophy, giving evidence of scholarship or original research. The essay is to be given in to the President of the College within one year after the writer of it graduates; that is, for the present year, on or before June 12, 1887.

**THE LYNDE PRIZES.**

Three prizes—the income of \$5,000, contributed by Charles R. Lynde, Esq., will be awarded by a committee appointed by the Faculty, to the three successful competitors in a debate on the Tuesday evening preceding Commencement. The competitors are six members of the Senior class—representatives of the Literary Societies—selected by committees appointed by the societies respectively, from their own members in the Faculty.

**THE BAIRD PRIZES.**

Through the liberality of Charles O. Baird, Esq., the following prizes, representing the income of \$6,000, will be given to those who excel in the Oratorical Exercises of the Senior class, viz.: The Baird Prize of \$100, to the best speaker of those who have ranked among the first six writers in any two of the three departments of English Literature, Rhetoric and Oratory; a prize for Oratory, of \$50, to the best speaker exclusive of the Baird Prizeman, of those who, in the same departments, have ranked among the first twelve writers; a Prize for Delivery, of \$30, to the best speaker exclusive of the two just mentioned; also, a Prize for Poetry, of \$50; and two prizes of \$40 and \$30, respectively, for the best and the second best written Disputations.

**THE CLASS OF 1859 PRIZE.**

The interest of \$2,000, given by the Class of 1859, will be awarded to that member of the Senior class who shall write the best essay on *Macaulay, as an Essayist and Historian*, and pass

the best examination on Shakespeare's *Henry VIII*. The essay must be handed in on or before June 1, and the examination will be held in June.

The subject of the essay for the Class of 1888 will be *Swinnburne, as a Poet and Critic*.

#### THE GEORGE POTTS BIBLE PRIZE.

The yearly interest of \$1,000, given in 1867 by Mrs. Sarah A. Brown, expended in the purchase of two copies of Matthew Henry's Commentary on the Bible, will be presented to the two best Biblical scholars of the Senior class at the end of their College course.

#### THE LYMAN H. ATWATER PRIZE IN POLITICAL SCIENCE.

This Prize, being the annual interest on the sum of \$1,000, contributed by the Class of 1883, was instituted as a memorial of Rev. Lyman H. Atwater, D.D., LL.D., Professor of Political Science. It will be given to that member of the Senior class who shall be adjudged by the Professors of Political and Social Science to have passed the best examination and written the best essay. The subject for the examination in 1887 will be *The History and Development of Land Tenure*. The subject for the essay will be *The Unearned Increment of Land Values*. The essay must be ready June 1, 1887; the date of the examination will be announced at that time.

#### THE WOOD SCHOLARSHIP.

The sum of \$150, the income of a legacy of Dr. George B. Wood, will be awarded to that member of the Junior class who shall stand highest for the Junior year.

#### JUNIOR ORATOR MEDALS.

Four gold medals, or books of equal value, will be awarded by a committee appointed by the Board of Trustees, to the four successful competitors in an Oratorical Contest on the Monday

evening before Commencement. The competitors are eight members of the Junior class—four from the Clisophilic and four from the American Whig Societies—selected by committees appointed by the societies respectively, from their own members in the Faculty.

#### THE MACLEAN PRIZE.

The Maclean Prize, founded by the will of the late Henry A. Stinnecke, consisting of the sum of \$100, will be given to that one of the orators chosen by the Literary Societies from the Junior class, who shall on the Monday evening before Commencement pronounce the best English oration.

The committee of judges will be composed of the Professor of Rhetoric and two graduates of the College appointed by the Board of Trustees.

#### DICKINSON PRIZE.

The Dickinson Prize, founded by John Dickinson, Esq., of New Jersey, in 1782, consisting of a medal of the value of \$60 (or its equivalent in money), will be awarded to that member of the Junior class who shall write the best dissertation upon *The Methods of Discovering Truth in the Various Sciences*. The dissertation to be presented on or before October 15, 1887.

#### CLASS OF 1876 MEMORIAL PRIZE FOR DEBATE IN POLITICAL SCIENCE.

This Prize is to be given annually by the Class of 1876 to the successful contestant in a debate on a subject of current interest in American Politics, to be held on Washington's Birthday, said prize to be the sum of \$50 the coming year, and thereafter the income of a fund raised for that purpose. The competitors, four in number, one from each class, are to be chosen by a vote of the respective classes.

#### THE STINNECKE SCHOLARSHIP.

The Stinnecke Foundation was established in 1870 by the will of the late Henry A. Stinnecke, of the Class of 1860, and was supplemented by a bequest received in 1876 from his aunt,



Miss Maria Stinnecke. The income is divided between the Stinnecke Scholarship of \$500 and the Maclean Prize of \$100.

The Stinnecke Scholarship, of the annual value of \$500, tenable during the College course, unless forfeited by neglect of study, "will be given to that person who, having entered the Sophomore class, shall pass the best examination at the opening of the session in September, 1887, in the Odes of Horace, the Eclogues of Virgil, and the Latin Grammar and Prosody, as well as the Anabasis or Cyropædia of Xenophon and the Greek Grammar." Students of the College who have been members of the Freshman class, as well as new students entering the Sophomore class, will be admitted to such examination. The committee of examiners is appointed by the Board of Trustees.

#### THE CLASS OF 1861 PRIZE.

The interest of \$1,200, given by the Class of 1861, will be awarded to that member of the Sophomore class who shall pass the best examination in June next on those portions of the Mathematical course of the Sophomore year which shall be especially designated by the Professor of Mathematics.

#### THE FRESHMAN FIRST HONOR PRIZE.

A prize of \$200, part of the income of the J. S. K. Fund, to be paid in quarterly installments during the following year, will be awarded to that member of the Freshman class who, having entered said class at the beginning of the College year, shall, at the end of the year, be reported to the Trustees by the Faculty as having attained the "highest average grade" in scholarship, provided he pursue his studies in this College and maintain a good standing during the Sophomore year. No student who has been suspended from College, or who has been put upon his last probation, shall be eligible to this prize.

## **SOCIETIES.**

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### **LITERARY SOCIETIES.**

The Cliosophic and American Whig Societies originated early in the history of the College. They are conducted by the undergraduates, but also include in their organization graduates and officers of the College. Both possess halls containing the rooms for meeting, reading rooms and valuable libraries of over 8,000 volumes each. They both pursue courses of literary exercises, award numerous prizes for orations, essays and debates and grant diplomas to their respective graduates.

A generous competition for College honors has always prevailed between them. On the evening before Commencement representatives of the societies from the Senior class engage in a public debate—on the preceding evening representatives from the Junior class engage in a competition in oratory. The details respecting the Lynde Debate and the Junior Orations will be found on pp. 144, 145.

These societies are considered a part of the educational appliances of the College, and students are advised to join them.

### **THE ENGINEERING SOCIETY.**

This is an organization conducted by the undergraduates of the Engineering Course, although its membership includes students in other departments of the College, and graduates.

Meetings are held weekly in the reading room of the society in University Hall, and the exercises are of a literary, scientific and technical character.

### **THE PHILADELPHIAN SOCIETY.**

This is a society composed of undergraduates, united by a covenant of mutual religious faith and sympathy. It was founded in the year 1825, and has always been an active and successful agency in promoting the religious life of the College. Devotional meetings are held on Thursday and Saturday evenings, under its direction, usually conducted by members of the Faculty. Murray Hall, the building belonging to the society, was erected from a bequest left for the purpose by Hamilton Murray of the

class of 1872. It contains, besides the room for worship, a reading room supplied with religious books and periodicals.

#### THE ST. PAUL'S SOCIETY.

The St. Paul's Society is an association similar in nature and aim to the Philadelphian, and is intended to be helpful, devotionally and practically, to those students in the College who have been accustomed to the worship of the Protestant Episcopal Church. It has weekly meetings, conducted by the students, and ordinarily a course of sermons is delivered annually in Trinity Church under its auspices.

### BUILDINGS.

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The buildings centre around NASSAU HALL, which dates back nearly to the foundation of the College, having been erected in 1756. One wing of this building is still occupied by students. The central and eastern portions contain the geological museums and lecture room. The School of Science building, the Chancellor Green Library, Dickinson Hall, Murray Hall and several of the dormitories have been erected within the last fourteen years. The Marquand Chapel, the gift of H. G. Marquand, Esq., of New York, was built in 1882. The Academic lectures and recitations are conducted mainly in Dickinson Hall, while the scientific lecture rooms and laboratories are principally in the building of the John C. Green School of Science. The students—except by special permission of the Faculty—reside in the College dormitories—the west wing of Nassau Hall, East College, West College, Reunion Hall, Witherspoon Hall, Edwards Hall and University Hall.

#### THE CHANCELLOR GREEN LIBRARY.

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The College Library began with the College itself, in a bequest of books by Gov. Belcher. The first catalogue, printed in 1760, shows that it then consisted of more than twelve hundred volumes. It suffered much during the Revolutionary War,

and it was burnt, with Nassau Hall, in 1802. The gifts of many liberal friends soon re-established it, and it slowly advanced to 9313 volumes in 1854. The want of resources for its increase kept it small, until the Elizabeth fund of \$50,000 was created by Mr. John C. Green in 1868. When the present library building was erected by him, in 1872-73, the collection contained about 25,000 volumes. Since that time its progress has been rapid, and it now consists of more than 60,000 volumes. The liberality of those who represent his estate has permitted an average yearly increase of 5,000 volumes.

The library is probably strongest in the departments of mathematical, physical, natural and mental science, but it is rich, also, in philology and literature. Few libraries surpass it in respect to works on the origin and early history of our language and our race. Generous efforts have been made to enrich it with the serial issues of scientific associations abroad. A collection of books on fine art, may be seen in a separate room. The income of the Library Fund, appropriated to the departments by a committee of the Faculty, is to be expended under the direction of the Professors of the respective departments.

The arrangement of books upon the shelves is by topics, and a pamphlet elucidating this arrangement is kept on every table and given on application to every student. The subject-catalogue of 984 pages is now completed. A manuscript appendix, constantly increasing, is accessible on application at the desk. The analysis of scientific periodicals is continually proceeding, forming a sort of "Poole's Index" for science, and the manuscript results, kept at the desk, are accessible to every Professor. A large collection of books of reference is kept constantly on the shelves, consisting of twenty encyclopædias, seventy periodicals and the dictionaries of twenty languages. A bulletin containing the titles of books bought during the preceding year, is printed early in every fall term, kept on the library tables, and given to every applicant.

At the west end of the building is a reading-room for the Faculty, furnished with more than fifty periodicals of high

character. Students are admitted on application at the desk, and they may borrow the past issues of each periodical when a new number has reached the table.

### *Library Hours.*

The Library is open every secular day; for the delivery and exchange of books from 10 A. M. to 1 P. M., and from 2 to 4 P. M.; for the consultation of books from 10 A. M. to 1 P. M., and from 2 to 5 P. M. The use of books is allowed, under the rules, to all the students. Resident graduates have the same privileges in the library as undergraduates.

## MUSEUMS.

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### **The E. M. Museum of Geology and Archæology.**

This Museum, occupying the central and eastern wings of Nassau Hall, contains collections which are distributed in the three general departments of Geology (including Mineralogy), Palæontology and Archæology. Their arrangement is especially adapted to the purposes of comparative study.

In the GEOLOGICAL DEPARTMENT a special room contains a unique collection of over 5,000 specimens of erratic boulders and drift materials from Switzerland. There is also a special room devoted to the typical rocks and fossils of the State of New Jersey. A collection of the typical rocks of the State of New York represents the series as described in the Geological Survey of that state.

There is in this department a large collection of minerals, containing about 2,600 specimens, bequeathed to the College by the late Archibald MacMartin, of New York. The perfection of the specimens, and the number of localities represented in each family, make this collection one of especial value.

The collections of the PALÆONTOLOGICAL DEPARTMENT fill two large halls, with extensive galleries. The central hall, or Synoptic Room, is especially designed and arranged with refer-

ence to the general course in Geology. There are mounted casts of the gigantic reptiles and mammals of the secondary, tertiary and quaternary ages. Around these the characteristic fossils of each of the great ages of life form as many groups, which follow each other in chronological order, while within each group the fossils are arranged according to their zoölogical affinities. The typical fossils selected agree, as far as possible, with those mentioned in Dana's Geology, as characteristic of different geological periods.

The upper or eastern hall contains the main collections for advanced students; on the platform are the skeletons of a mastodon, an Irish deer, a cave bear, and some of the extinct birds of New Zealand; also the skulls of uintatherium and loxolophodon, and a remarkably complete skeleton of cervalces. Surrounding the room is a very perfect collection of vertebrate and invertebrate fossils from Europe and America, illustrating the vertebrate and invertebrate forms of all the geological epochs. Included in this series are the fine Eocene and Miocene fossils, procured in the West by the various Princeton collecting parties. There is also a series of fossil insects and plants from Colorado. Altogether the number of fossils, not counting duplicates, is 9,000.

ARCHÆOLOGICAL DEPARTMENT.—Here are relics of the Swiss lake dwellings, and numerous implements of stone and bronze from Denmark; also several hundred flint instruments from most of the classical localities of the palæolithic and neolithic ages of France.

America is represented, in the pottery and human remains of the mound builders, by several hundred specimens of Mexican and Peruvian pottery, and by a number of recent Indian relics. The interesting ethnological collection of objects, chiefly from Alaska and New Mexico, which Dr. Sheldon Jackson presented to the Theological Seminary of Princeton, has been transferred to this Museum by the trustees of that institution, with the consent of the donor. The Archæological Gallery contains also a series of models of the cliff-ruins of the Southwest, executed under the direction of Dr. Hayden.

Below the eastern hall are the lecture and working rooms.

### **Zoological Museum.**

The collections forming this Museum have been chiefly made from the endowment fund of the John C. Green School of Science. There have also been many smaller donations to the Museum from time to time. The collections are placed in the large upper hall of the School of Science building, and are at present especially rich in osteological specimens. On the same floor are the laboratory and working rooms of the Curator of the Museum. The collection of vertebrates includes a large number of mounted and disarticulated skeletons of the mammals, reptiles, birds and fishes, series of the birds of New Jersey and of other districts of North America, carefully mounted, and alcoholic specimens. A feature of the ornithological collection is the very large number of unmounted bird skins, arranged for the purpose of comparative study of the plumage, beak and feet. Among the invertebrates are a series of ascidians, echinoderms, molluscs, crustaceans, insects, worms, corals, sponges, and microscopic preparations of small forms. The whole collection has also been catalogued and numbered. Students can apply to the Assistant Curator for access to the catalogue and cases containing the skeletons.

### **Herbarium and Botanical Laboratory.**

This is on the second floor of the School of Science building, and is arranged as a museum of the botanical collections, also as a working laboratory for students. The plants are classified according to Bentham and Hooker's *Genera Plantarum*, and include specimens from the different sections of the United States, and from Europe and Australia. There are extra specimens for laboratory use, and dissecting and compound microscopes, anatomical instruments, section cutters, models, diagrams and books of reference.

Thanks are due to Prof. Thos. C. Porter of Lafayette College for rare and new forms of New Jersey plants for the Parker Herbarium.

## LABORATORIES AND APPARATUS.

### Physical Laboratory and Apparatus.

The Physical Laboratory is fitted up with tables and other arrangements to accommodate about twenty students at once. Besides the appliances usually employed in lecture demonstrations, the cabinet of apparatus contains all the instruments of precision required in the experimental courses.

The following deserve especial mention :—A fine balance by Becker, sensitive to one milligramme under a load of twenty kilogrammes. A kathetometer (Grunow), with scale of one metre. A dividing engine and comparator (Rogers). A cylinder chronograph, for all time observations in the laboratory, in electrical communication with the standard clock of the astronomical observatory. A diapason chronograph (Koenig), for minute intervals of time. Pendulum apparatus, of both Borda's and Kater's forms. A spectrometer (Fauth) with 18-inch circle reading by microscope to single seconds. Ditto (Grunow), with smaller circle, reading to 10''. Ditto (Stackpole), reading to 30''. A number of diffraction gratings (Rutherford and Rowland), ruled upon glass and speculum metal; to be used with these spectrometers. A large spectroscope, with dispersive power of twelve prisms (Browning). Sir William Thomson's absolute electrometer and quadrant electrometer (White). Lippmann's capillary electrometer. A set of accurate resistance coils, and standard condenser (Elliot). A large number of galvanometers suited to the different requirements of the laboratory. Sets of standard thermometers; apparatus for calorimetric inquiries; photometers, etc.

### Chemical Laboratories.

The laboratory and cabinets of the department of General Chemistry are fully equipped for the illustration of the courses in the two branches of General and Applied Chemistry.

There is a large laboratory for the department of Analytical Chemistry, and connected with this are the Professor's and Assistant's rooms, acid room, weighing room and store room,



provided with the best appliances. There is also an Assay Laboratory, with crucible and muffle furnaces. These laboratories are all in the School of Science building, and each student has a desk for his own use, with cupboards and drawers in which he can lock up such apparatus as is supplied to him individually.

### **Mineralogical Laboratory and Collection of the School of Science.**

The laboratory contains desk-room for fifty students. Each desk is fitted with gas connections for blowpipe work in Determinative Mineralogy, and contains a locked drawer for the student's apparatus.

There are three cabinets of minerals. The principal one contains over five thousand specimens, embracing nearly every mineral species. Two smaller cabinets, one with labeled and the other with unlabeled minerals, are provided for practice with the classes, and to these two cabinets the students have free access.

There is also a collection of 240 specimens of typical rocks; together with a large number of Fuess' rock sections, as well as sections from other sources, for the study of Lithology.

The laboratory is provided also with section cutters, grinding lathes, and other appliances for the special study of minerals and rocks; including a complete Groth's polarizing apparatus with goniometer, a large Babinet goniometer, Norremberg's polarizing apparatus, Rosenbusch's microscope, and minor apparatus.

An interesting collection of lead vanadates from Colorado was presented to the mineralogical cabinet by Dr. L. W. Ricketts last spring.

### **Histological Laboratory.**

This laboratory is situated on the upper floor of the west wing of Nassau Hall. It is fitted to accommodate twenty-two students at a time, each of whom is provided with the requisite instruments, reagents and staining fluids for the study of the various tissues. The microscopes have been selected with a view to convenience in practical work. A large private collec-

tion of slides, illustrating the general subject of Histology, is also placed at the disposal of the students, as well as books of reference and American and foreign publications. The laboratory is open at all hours to its regular students.

### **Morphological Laboratory.**

This laboratory is adjacent to the School of Science building. It is designed for the practical study of Vertebrate Anatomy, with abundant facilities for dissection and experimental work. Besides the ordinary apparatus, there is a chick incubator for embryological study, and an aquarium containing live amphibia belonging to the different groups. For comparative study there belongs to the laboratory a collection of disarticulated skeletons of the typical vertebrates, and a number of alcoholic specimens. The laboratory library contains the principal works of reference. There is a fee of \$3 or \$4 for ordinary courses in dissection, part of which is a deposit upon dissecting instruments, to be refunded at the close of the course. The laboratory is open during the day and evening.

## **ASTRONOMICAL OBSERVATORIES.**

### **The Halsted Observatory.**

This is appropriated to scientific work, chiefly in the department of Astronomical Physics. The building is of stone, with an iron dome, 39 feet in diameter. The power for moving the dome and its sliding shutter is furnished by a gas engine. The principal instrument is the great equatorial of 28 inches aperture and 80 feet focal length, made by the Clarks of Cambridge. It is provided with all the usual micrometers, spectroscopes and other accessories on a scale proportional to the instrument. The building contains also two clocks and a chronograph. An Edison dynamo-electric machine supplies the electric currents required in spectroscopic investigation.

### **The Observatory of Instruction.**

This establishment is devoted entirely to the use of students, and is fully equipped for its purpose. It possesses an equatorial

(by Clark) of  $9\frac{1}{2}$  inches aperture, with an unusual complement of spectroscopic and other accessories. It has also a 9-inch reflector; a meridian circle with telescope 4 inches in diameter; two transit instruments with 3-inch telescopes, both of them arranged for use as zenith-telescopes; a 3-inch prime-vertical instrument; a chronograph; two standard clocks, and two chronometers. There are also a number of sextants, and all the other subsidiary apparatus required for carrying out the work detailed on page 69.

### GYMNASIUM.

The Gymnasium was built in 1869 by Mr. Robert Bonner and Mr. Henry G. Marquand. It is thoroughly equipped with all the apparatus necessary for a complete physical training. It has hot and cold shower and plunge baths, dressing rooms, bowling alleys, and besides the main hall, a room for base ball practice. There is also a gallery for visitors. The gymnasium is open from 7 to 8 A. M., 12 M. to 1.30 P. M., 5 to 6.30 P. M., on every day except Saturday, when it is open from 12 M. to 6.30 P. M. During the second term exercise in the gymnasium is required of all members of the Sophomore and Freshman classes, three times a week; the remainder of the year attendance is optional. Classes in the use of Indian clubs and calisthenics are held every day during the noon and afternoon hours. These exercises are adapted to all grades of strength, and are such as to maintain and improve in health all who take part in them, health being the primary and strength the secondary object of exercise. Special exercise on the various apparatus is under the personal supervision of the Superintendent, who is also at the command of any student for advice in regard to physical development and the laws of health. During the fall term there is an outdoor athletic meeting for prizes; in the spring term a gymnastic contest also for prizes, and at Commencement a gymnastic exhibition.

## GENERAL COLLEGE ORDERS.

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### TERMS AND VACATIONS.

The year is divided into two terms of fourteen weeks each and one of nine weeks.

The *first* term of the *present* College year (1886-7), began on Wednesday, the 15th of September, 1886, and ends on Wednesday, the 22d of December. The *second* term begins on Wednesday, the 5th of January, 1887, and ends on Wednesday, the 13th of April. The *third* term begins on Wednesday, the 20th of April, and ends on Wednesday, the 22d of June, 1887—the day of the Annual Commencement.

Students are required to return to College on the first day of each term, and absences from any College exercise at the beginning of a term count double.

Students are not allowed to leave College during term-time without express permission obtained from the Faculty or from the officer of the class to which they belong.

### COMMENCEMENT ANNIVERSARIES.

THE ANNUAL COMMENCEMENT takes place on the Wednesday preceding the last Wednesday in June.

THE BACCALAUREATE SERMON of the President to the graduating class is delivered in the College Chapel on the Sunday preceding Commencement.

The Class Day Exercises of the graduating class and the Junior Oratorical Contest are held on the Monday preceding Commencement. The Reading of Theses by the graduating class of the School of Science, the Annual Meetings of the Literary

Societies, the Annual Meeting of the Alumni Association of Nassau Hall, and the Lynde Prize Debate are held on Tuesday.

### **PUBLIC WORSHIP.**

Prayers are offered in the Marquand Chapel every week-day morning. In these services members of the Faculty officiate in turn.

Divine service, under the superintendence of the President, is held in the Marquand Chapel, on Sunday, at 11 o'clock A. M.

The service is conducted, alternately, by Dean Murray and the clerical members of the Faculty.

Religious services are held in the Chapel every Sabbath afternoon at 5 o'clock.

Permission to attend divine service elsewhere than in the Chapel, on special occasions, is granted on application to the President. For permission to attend regularly one of the churches of the town on Sabbath morning, a written request from the parent or guardian of the applicant must be presented to the President.

### **RELIGIOUS INSTRUCTION.**

Biblical instruction is given during the week, as follows :

To the Senior class by Dr. Murray : The Development of Doctrine in the new Testament.

To the Junior class by Professor Ormond : The Book of Acts.

To the Sophomore Academic class by Professor Orris : St. John's Gospel in the Greek ; by Professor Winans : St. Luke's Gospel.

To the Freshman Academic class by Professors Hunt and West and Tutor Westcott : General Introduction to the Study of the Scriptures, the Poetical Books of the Old Testament and the Parables of our Lord.

To the Freshman and Sophomore classes in the School of Science by Professor Macloskie : Typology of the Old Testament and the Life of Christ.

### ATTENDANCE UPON COLLEGE EXERCISES.

The several classes ordinarily attend three recitations or lectures every day, except Saturday, when there are but two College exercises.

Every undergraduate student is required to attend all College exercises in the Chapel, to be present during the lectures and recitations of his class, and is expected to avail himself of the privileges of the Library and Gymnasium upon the conditions and at the hours appointed.

Each student is allowed a certain limited number of absences from chapel and recitations during the term. When a student's absences exceed this gratuity they are charged against his gratuity for the next term, or otherwise dealt with by such discipline as the Faculty may direct.

### CHARITABLE FUNDS.

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The RICHARDS Fund. A bequest of Mrs. Esther Richards, of New York, amounting to \$2,970.32, for the benefit of candidates for the ministry. Received in 1790.

The LESLIE Fund. A bequest of James Leslie, of New York, a graduate of the Class of 1759, amounting to \$10,677.49, for "the education of poor and pious youth with a view to the ministry of the Gospel in the Presbyterian Church." Received in 1792.

The HODGE Fund. A bequest of Hugh Hodge, of Philadelphia, of a house and lot on Market street, above Second (No. 205), "to be held by the Trustees in trust, to lease out from time to time, and the rents to be applied to the support and education of pious youth for the ministry." Received in 1805. The net income for the current year will amount to about \$750.

The VANARSDALE Fund. A bequest of Robert VanArsdale, of Newark, N. J., of the Class of 1826, amounting to \$3,000, "in trust for promoting charitable instruction in the College of New Jersey, according to the discretion of the Faculty." Received in 1875.

ENDOWED SCHOLARSHIPS.

1-3.	The COLT Scholarships, founded by Roswell Colt, of Paterson, N. J.,	\$3000.
4.	The NEWKIRK Scholarship, founded by Matthew Newkirk, of Philadelphia,	1000.
5.	The JOHN JOSEPH RANKIN Memorial Scholarship, founded by his father Wm. Rankin, of Newark, N. J.,	1000.
6.	The CRESSWELL Scholarship, founded by A. Cresswell, of Kishacoquillas, Pa.,	1000.
7.	The ISAAC R. RANKIN Scholarship, founded by Isaac R. Rankin, of Newark, N. J.,	1000.
8.	The MUSGRAVE Scholarship, founded by Rev. George W. Musgrave, D.D.,	1000.
9.	The COGSWELL Scholarship, founded by Rev. Jonathan Cogswell, D.D.,	1000.
10.	The GREEN Scholarship, founded by Hon. Henry W. Green, LL.D.,	1000.
11-15.	The LENOX Scholarships, founded by James Lenox, of New York,	5000.
16.	The HODGE Scholarship, founded by Dr. Hugh L. Hodge, of Philadelphia,	1000.
17.	The A. B. BAYLISS Scholarship, founded by A. B. Bayliss, of Brooklyn,	1000.
18.	The HENRY J. VAN DYKE Scholarship, founded by George L. Sampson, of Brooklyn,	1000.
19.	The GREGORY Scholarship, founded by Dudley S. Gregory, of Jersey City,	1000.
20.	The FIRST PRESBYTERIAN CHURCH OF PEEKSKILL Scholarship, founded by members of the Church,	1000.
21.	The VAN VORST Scholarship, founded by Hon. John Van Vorst, of Jersey City,	1000.
22.	The JANEWAY Scholarship, founded by the Rev. Jacob J. Janeway, D. D.,	1000.
23.	The PRESBYTERIAN CHURCH OF HUNTINGTON, L. I., Scholarship, founded by the ladies of the Church,	1000.
24.	The BACKUS Scholarship, founded by E. F. Backus, of Philadelphia,	1000.
25.	The VAN SINDEREN Memorial Scholarship, founded by Mrs. and Miss Van Sinderen, of Brooklyn,	1000.
26.	The NORRIS HALSTED Scholarship, founded by Gen. N. Norris Halsted, of Newark, N. J.,	1000.
27.	The MACLEAN Scholarship, founded by Drs. John and George M. Maclean,	1000.
28.	The HAINES Scholarship, founded by Richard T. Haines, of Elizabeth, N. J.,	1000.
29.	The JACKSON Scholarship, founded by the Hon. John P. Jackson, of Newark, N. J.,	1000.

30. The TUTTLE Scholarship,  
founded by Joseph N. Tuttle, of Newark, N. J., 1000.
31. The GERTRUDE N. WOODHULL Memorial Scholarship,  
founded by her son, Dr. John N. Woodhull, of Princeton, 1000.
32. The NATHANIEL W. TOWNSEND Memorial Scholarship,  
founded by his daughter, Mrs. Daniel Haines, 1000.
33. The FIRST PRESBYTERIAN CHURCH OF BRIDGETON  
Scholarship, founded by members of the Church, 1000.
34. The SKIDMORE Scholarship,  
founded by Joseph P. Skidmore, of New York, 1000.
35. The SPENCER Scholarship,  
founded by L. S. Spencer, 1000.
36. The JEREMIAH D. LALOR Memorial Scholarship,  
founded by a friend, 1000.
37. The MARQUAND Scholarship,  
founded by Frederick Marquand, of Southport, Conn., 1000.
38. The FIRST PRESBYTERIAN CHURCH OF TRENTON  
Scholarship, founded by members of the Church, 1000.
39. The CAMERON Scholarship,  
founded by the Hons. Simon and Donald Cameron, 1000.
40. The SECOND PRESBYTERIAN CHURCH OF ELIZABETH  
Scholarship, founded by members of the Church, 1000.
41. The C. S. BAYLISS Scholarship,  
founded by Charles S. Bayliss, of Brooklyn, 1000.
42. The ELIZA MUSGRAVE GIGER Memorial Scholarship,  
founded by her son, Prof. George M. Giger, D.D., 1000.
43. The BLAIR Scholarship,  
founded by James Blair, of Scranton, Pa., 1000.
44. The PENNINGTON Scholarship,  
founded by Dr. Samuel H. Pennington, of Newark, N.J., 1000.
45. The FENTON Scholarship,  
founded by Aaron Fenton, 1000.
46. The TRASK Scholarship,  
founded by Alanson Trask, of Brooklyn, 1000.
47. The WITHINGTON Scholarship,  
founded by Chandler Withington, of Kingston, N. J., 1000.
48. The NEWARK Scholarship,  
founded by the will of Henry Rogers, of Newark, N.J., 1000.
49. The CARTER Scholarship,  
founded by Aaron Carter, of Newark, N. J., 1000.
- 50-54. The HOLMES Scholarships,  
founded by Capt. Silas Holmes, of New York, 5000.
55. The COLWELL Scholarship,  
founded by Stephen Colwell, of Philadelphia, 1000.
56. The AITKEN Scholarship,  
founded by John Aitken, of New York, 1000.
57. The BULLARD Scholarship,  
founded by Mrs. P. Bullard, 1000.



58. The CHARLES DICKINSON HAMILL Memorial Scholarship,  
founded by his father, the Rev. Samuel M. Hamill, D. D., 1000.
59. The CYRENIUS BEERS Memorial Scholarship,  
founded by his daughter, Miss Julia Beers, 1000.
60. The JACOBUS Scholarship,  
founded by Peter Jacobus, of Newark, 1000.
61. The MATTHEW B. HOPE Scholarship,  
founded by the Trustees as an acknowledgment of  
the services of Prof. Hope in raising an endowment  
of over \$100,000, 1000.
62. The JOHN MACLEAN Scholarship,  
founded by a friend of President Maclean, 1000.
63. The WHITE Scholarship,  
founded by William White, Esq., 1000.
64. The ELIZABETH VAN CLEVE Scholarship,  
founded by the Hon. C. S. Green of Trenton, N. J., 2000.
65. The BLOOMFIELD Scholarship,  
founded by the Hon. Amzi Dodd, of Bloomfield, N. J., 1000.
66. The FLAGLER Scholarship Fund,  
the gift of Henry M. Flagler of New York City, 1500.
67. The JAMES MCCOSH Scholarship,  
founded by friends of President McCosh in N. Y. City, 1000.
- 68-69. The WISTAR MORRIS AND CHARLES MORRIS WOOD  
Scholarships, founded by their father, the Rev. Chas.  
Wood, of Germantown, Pa., 2000.
70. The CLASS OF 1856 Scholarship,  
founded by members of the Class of '56, 1000.
71. The CLASS OF 1841 Scholarship,  
founded by members of the Class of '41, 1000.
72. The ALBERT DOD BROWN Memorial Scholarship,  
founded by his mother, Mrs. Susan D. Brown, of  
Princeton, N. J., 1000.

The above scholarships are for the benefit of students in the Academic Department, with the exception of the ELIZABETH VAN CLEVE Scholarship which may be assigned to a student in the School of Science.

About sixty scholarships were founded between the years 1853 and 1858, mainly through the efforts of President Maclean and Professor Hope. The last nine were founded since the beginning of the Academic year 1885-6.

## PECUNIARY AID.

The College has for many years remitted, on application, the tuition of candidates for the ministry, of the sons of min-

isters, and also of other applicants who present satisfactory testimonials of good moral character and of more than ordinary intellectual ability, with the assurance that the aid requested is absolutely needed. No candidate for admission to College who is unexceptionable morally and intellectually will be refused admission because of inability to pay the charge for tuition.

In consequence of this liberal policy the amount of tuition remitted has increased until it is now more than double the entire income from the scholarship and charitable funds. If this policy is to be continued a large increase of these funds is urgently demanded. The Trustees have accordingly appointed a joint committee of members of the Board of Trustees and of the Faculty, to raise, if possible, for the object indicated, \$100,000. This effort is commended to the attention and favor of the Alumni and other friends of the College.

Although the charge for tuition, since the first scholarships were founded, has been advanced from \$60 to \$100, scholarships in the Academic Department for the benefit of candidates for the ministry, sons of ministers, or other students needing assistance, may be founded by the payment of \$1,000,—the scholarship to be designated as the donor may direct.

Applications for scholarships, or for aid from the charitable funds, should be made to Professor Duffield.

### EXPENSES.

The following is the Schedule of the College expenses for 1886-7 :

Board, 37 weeks.....	\$ 2.75 to \$7 per week.
Washing, 37 weeks.....	50 cents per week.
Tuition, Academic.....	100.00 per annum.
Tuition, School of Science.....	120.00 per annum.
Tuition, Special Course in Analytical Chemistry...	120.00 per annum.
Tuition, extra for Laboratory Chemistry, Senior Elective.....	18.00 per annum.
Room Rent (according to location of rooms).....	25.00 to \$200 per annum.
Fuel Deposit (according to location of rooms).....	17 00 to \$26 per annum.
Gas Deposit (according to location of rooms).....	24.00 to \$42 per annum.
Servants and Public Rooms (Library, Gymnasium, Museums, etc.).....	40.00 per annum.
Matriculation Fee, payable on entrance.....	5.00.
Graduation Fee, payable third term, Senior year...	12.00.

For other Special Courses than that in Analytical Chemistry arrangement may be made upon consultation with the Professor in charge.

The charges for fuel and gas are approximations based upon the greatest amount used. An account of the actual consump-

tion is kept with each room, and the exact charge is adjusted at the end of the year. The charge for fuel includes the cost of kindling, and the labor of carrying coal, making fires, &c.

**Apparatus Deposits.**—Students pursuing certain courses in the School of Science are required to make deposits to pay for apparatus injured or destroyed. At the end of the term any excess in favor of the student is placed to his credit on the bill for next session. The deposits in the courses for B.S. are :—Sophomores, first term, \$12; second term, \$10; third term, \$5. Juniors taking any work in chemical analysis, second term, \$12; third term, \$8. Seniors electing the course in Chemistry and Mineralogy, first term, \$20; second term, \$15; other Seniors taking any work in chemical analysis, first term, \$15. The deposits in the course for C. E., all payable in the first term, are :—Freshmen, \$3; Juniors, \$6; Seniors, \$4; all of the foregoing being for apparatus in the Engineering Department; also, Sophomores, \$5 for the Engineering Department, and \$12 for blowpipe apparatus. Academic Seniors, electing Laboratory Chemistry, will deposit \$7, payable in the first term.

### ESTIMATES OF ANNUAL EXPENSES.

Attention is specially called to the following approximate estimate of the necessary annual expenses for a student occupying a room in College, without including clothes, travelling or vacation expenses:

	<i>Min.</i>	<i>Medium.</i>	<i>Max.</i>
Board, 38 weeks, at \$2.75 to \$7.00.....	\$104	\$152	\$266
Washing, 38 weeks, at 50c. per week.....	19	19	19
Tuition and Fees.....	140	140	140
Room Rent.....	25	60	200
Fuel and Light (Kerosene or Gas).....	15	25	50
Books.....	15	20	25
Hall Dues and College Subscriptions.....	7	25	50
	<hr/> \$325	<hr/> \$441	<hr/> \$750
Deduct for Students on Scholarships.....	100		
	<hr/> \$225		
Deduct for Candidates for Ministry.....	30		
See page 163.	<hr/> \$195		

### College Bills.

All College expenses, including board and washing, must be paid in advance to the Treasurer of the College.

Students are required to call at the Treasurer's office in the course of the first ten days of each session, and to give information as to their place of boarding, etc., so that their bills can be made out. All bills must be paid within the first four weeks of the session. Failure to comply with this rule shall deprive the student of the privileges of the College until payment is made, unless excused by special vote of the Faculty.

When a student enters College before the middle of a session, he shall pay in full the usual College charges for that session, with the exception of the charges for board and washing; if he enter after the middle of the session, he shall pay one-half. For board and washing he shall pay in proportion to the time.

When a student leaves the College, whether voluntarily or by dismissal, before the middle of any session, one-half of the charges for tuition and public rooms for that session shall be refunded. But in the case of temporary absence and subsequent return, although the absence be for more than half a session, no such rebate shall be granted.

When a student is dismissed from College for any cause, the advance deposit for board, washing, fuel and gas, beyond the time of his dismissal shall be refunded to his parent or guardian.

When at the end of the first or second sessions the amount of the advance deposit proves to be in excess of the sum required to defray the board, washing or room bills of any student, the excess shall be credited on his bill for the next session. At the end of the College year the amounts overpaid for board, washing, room-rent, fuel, or gas shall be refunded by the Treasurer to the student's parent or guardian.

#### **RULES RESPECTING RENTAL AND ALLOTMENT OF ROOMS.**

1. Whenever a student desires to occupy a room in one of the College buildings, he and his parent or guardian shall be required to sign a room agreement, engaging to pay the rent and charges of said room for the ensuing Academic year, or for the remainder of the current year, as the case may be.

2. The tenure of all rooms so engaged shall be subject to the following conditions as regards damages and repairs, viz.: (1.) All damage done to a room beyond the ordinary wear and tear, shall be made good as soon as possible at the expense of

the occupant. This provision includes the breakage of glass whether by accident or design. The occupant shall employ the proper College workmen and pay the cost of the repairs at once to the Treasurer. (2.) The occupants of a room shall deposit with the Curator the sum of twenty-five cents for every key furnished, which amount shall be refunded on return of the keys.

3. Students now occupying rooms, or to whom rooms shall hereafter be allotted, may have the option of retaining such rooms until the end of their College course, on condition of annually notifying the Treasurer of their intention of retaining their room for the following year, and signing a new room-agreement before May 15th; otherwise their rooms will be considered as vacated, and will be included in the annual allotment.

4. Rooms becoming vacant at or near the close of the College year shall be assigned to new occupants, by lot. The members of the Junior and Sophomore classes who desire a choice shall draw lots first; then, the Freshmen. As soon as the drawing is completed the rooms must at once be selected in order of priority of choice.

5. No student will be entitled to the room allotted him unless the room agreements shall have been signed and returned to the Treasurer before June 5th.

6. New students shall have the choice of any remaining rooms in the order of their application, after admission into College, on condition of immediately signing the room agreement, and depositing with the Treasurer the rent for the next ensuing term.

7. Every student who draws or retains a room is expected to occupy the same, and pay the rent and charges, or his share thereof, until the end of the College year, unless sooner released by the proper authority.

8. A student who expects to be absent on leave for a term may be released from the above obligation, by notifying the Treasurer before the beginning of the term, and by giving up the room; but no abatement or drawback for room rent will be made to any student vacating his room during a term, unless by express direction of the Faculty.

9. Whenever, by any contingency, one of two room-mates is permitted or obliged to cancel his room agreement, the re-

maining occupant must vacate the room at the end of the current term, unless he agrees to pay the whole rent, or provides a room-mate who shall join him in signing a new agreement for the remainder of the College year. When one of two occupants of a room is a member of the Senior class, the room shall become vacant when the Senior graduates, and be subject to the provisions of Rule 4, except in cases where the joint occupancy has continued for at least one year.

10. When rooms are vacated during the first or second term the rent shall be paid to the end of the term (see Rule 8), at which time the students who may have registered their names as applicants for vacancies shall draw for them by lot.

11. Exchange of rooms, or substitution of one occupant for another, must be by authority of the Treasurer, and any student moving into a room, without authority *previously obtained*, will be liable to a fine of \$10, and be required to vacate the room. Such exchanges can only be made at the end of a term, or in the course of the first three days of the following term.

12. No tenant of a College room who is permitted or compelled to vacate such room will be allowed to transfer directly or indirectly any interest in or title to the room.

13. When a student vacates a room he shall immediately remove the furniture therefrom unless the student to whom the room is assigned elects to purchase the same. In case a sale is agreed upon between the parties, the price to be paid by the purchaser shall be ascertained by deducting from the cost price of the furniture a discount of twenty per cent. per annum for the time the same has been in use by the vendor; provided that the price to be paid for the furniture in a room shall in no case exceed \$200. All sales shall be approved by the Treasurer before the same are finally consummated.

14. Students leaving College, or otherwise vacating their rooms, shall be allowed to store their furniture in a room assigned by the College authorities, under the charge of a salesman appointed by the College, where it may be offered for sale. Furniture remaining unsold at the end of three months, if not removed by the owner, will be disposed of at public auction to the highest bidder.







THE  
CATALOGUE

OF THE

COLLEGE OF NEW JERSEY

AT

PRINCETON

YEAR





PROSPECT AVE.

WASHINGTON AVE.

COLLEGE BUILDINGS.

*Erected*

1. Nassau Hall, . . . 1756
2. Dean's House, . . . 1756
3. College Offices, . . . 1803
4. East College, . . . 1833
5. West College, . . . 1836
6. Clio Hall, . . . 1838
7. Whig Hall, . . . 1838
8. Old Chapel, . . . 1847
9. President's House, 1849
10. Halsted Observat'y, 1869
11. Gymnasium, . . . 1869
12. Reunion Hall, . . . 1870
13. Dickinson Hall, . . . 1870
14. Library, . . . 1873
15. School of Science, 1873
16. University Hall, . . 1876
17. Witherspoon Hall, 1877
18. Work'g Observat'y, 1878
19. Murray Hall, . . . 1879
20. Edwards Hall, . . . 1880
21. Marquand Chapel, 1881
22. Morphological Labor'y
23. Biological Labor'y 1887
24. School of Art
25. First Presbyt'n Church
26. R. R. Station.



18.



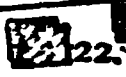
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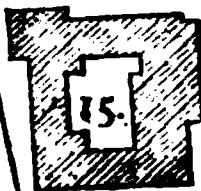
21.



23.



13.



15.



## CALENDAR.

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### 1887.

- Sept. 13-14.* Examinations for admission, in Princeton only.  
*Sept. 14.* First term begins—College assembles at 3 P. M.  
in Marquand Chapel.  
*Sept. 15.* Conditioned and unexamined students assemble  
in the Old Chapel at 10 A. M.  
*Sept. 28.* Preliminary examinations for University degrees.  
*Nov. 10.* Stated Meeting of the Board of Trustees.  
*Nov. 23-28.* Thanksgiving recess.  
*Dec. 12-21.* Examinations. End of first term.  
*Dec. 21-Jan. 4.* Christmas vacation.

### 1888.

- Jan. 4.* Second term begins.  
*Jan. 26.* Day of Prayer for Colleges.  
*Feb. 9.* Stated Meeting of the Board of Trustees.  
*Feb. 22.* Washington's Birthday—Exercises in University  
Hall.  
*April 11.* End of second term.  
*April 11-18.* Spring vacation.  
*April 18.* Third term begins.  
*May 12.* Last day for renewing room agreements for '88-9.  
*May 23-June 2.* Senior final examinations.  
*June 2.* Annual allotment of rooms.  
*June 6-16.* Examinations of the three lower classes.  
*June 17.* Baccalaureate Sermon.  
*June 18.* Class Day—Junior Orations, 7:30 P. M.  
*June 19.* Reading of Theses by Scientific students—An-  
nual Meetings of Literary Societies and Alum-  
ni Association—Lynde Prize Debate, 7:30 P.M.  
*June 20.* 141st Annual Commencement.  
*June 18-20.* Commencement Meeting of Board of Trustees.  
*June 21-22.* Examinations for admission, held simultane-  
ously in Princeton and Western cities.  
*June 22-Sep. 12.* Long vacation.  
*Sept. 11-12.* Examinations for admission, and on entrance  
conditions, in Princeton only.  
*Sept. 12.* First term begins—College assembles at 3 P. M.  
in Marquand Chapel.

- Sept. 13.** Conditioned and unexamined students (not candidates for entrance) assemble in the Old Chapel at 10 A. M.
- Sept. 26.** Preliminary examinations for University degrees.
- Nov. 8.** Stated Meeting of the Board of Trustees.
- Nov. 28-Dec. 3.** Thanksgiving recess.
- Dec. 10-19.** Examinations. End of first term.
- Dec. 19-Jan. 2.** Christmas vacation.

1887.							1888.																
	S	M	T	W	T	F	S		S	M	T	W	T	F	S		S	M	T	W	T	F	S
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	31											1	2	3	4					1	2	3	4
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The College embraces a Board of Trustees and a Faculty of Instruction with certain additional officers employed in the administration of affairs. The undergraduate Societies and Alumni Associations, though not strictly parts of the organization of the College, are fostered by it, and coöperate with it.

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2. *Italian Painting*, PROF. FROTHINGHAM.
3. *Suetonius*, PROF. PACKARD.
4. *Æschylus*, PROF. ORRIS.
5. [*Thucydides*, PROF. WINANS.]
6. [*Latin Poets*, PROF. WEST.]

### SOPHOMORE YEAR.

1. *English*, PROF. HUNT.
2. *French Prose Writers*, DR. WESTCOTT.

NOTE.—The courses in brackets are offered during the second and third terms.

## ACADEMIC DEPARTMENT.

## PROFESSORS.

## I. DEPARTMENT OF PHILOSOPHY.

1. THE PRESIDENT. *Modern Philosophy and Metaphysics.*
2. PROF. PATTON. *Ethics.*
3. PROF. ORMOND. *History of Philosophy, Logic and Psychology.*
4. PROFS. SCOTT AND OSBORN. *Physiological Psychology.*
5. PROF. SHIELDS. *Harmony of Science and Religion.*
6. PROF. SLOANE. *History and Political Science.*
7. PROF. JOHNSTON. *Jurisprudence and Political Economy.*
8. PROFS. PRIME, MARQUAND AND FROTHINGHAM. *History of Art and Archaeology.*
9. PROF. WEST. *Pedagogics.*

## II. DEPARTMENT OF LANGUAGE AND LITERATURE.

1. PROFS. CAMERON, ORRIS AND WINANS. *Greek.*
2. PROFS. PACKARD, WEST AND MR. RODDY. *Latin.*
3. PROFS. MURRAY, HUNT, RAYMOND AND MR. MILLER. *English.*
4. PROF. KARGÉ AND DR. WESTCOTT. *French and German.*
5. PROF. HUNT. *Anglo-Saxon.*
6. PROF. WINANS. *Sanskrit.*

## III. DEPARTMENT OF MATHEMATICS AND SCIENCE.

1. PROFS. DUFFIELD, FINE AND MR. REED. *Mathematics.*
2. PROFS. YOUNG AND MCNEILL. *Astronomy.*
3. PROFS. BRACKETT AND MAGIE. *Physics.*
4. PROFS. SCHANCK, CORNWALL AND DR. MCCAY. *Chemistry.*
5. PROFS. SCHANCK, MACLOSIE, SCOTT, OSBORN, AND MR. PHILLIPS. *Biology.*
6. PROF. MACLOSIE. *Botany.*
7. PROF. LIBBEY. *Histology and Physical Geography.*
8. PROFS. SCOTT AND OSBORN. *Geology and Palaeontology.*

## UNDERGRADUATE STUDENTS.

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### SENIOR CLASS.

Robert Staunton Adams,	Brooklyn, N. Y.,	8 W M W H
Horace Anderson,	Indianapolis, Ind.,	19 S M R H
John W. Ballantine,	Hamden, N. Y.,	11 N M R H
Frederick Griswold Beebe,	Port Byron, N. Y.,	2 N R H
James Seguin de Benneville,	Philadelphia,	2 W W H
Charles Newbold Black,	New York City,	11 S E
Collins Pechin Bliss,	New York City,	7 E W H
Edgar Sumner Bliss,	Philadelphia,	34 N E H
David Dandle Brough,	Providence, R. I.,	8 N M R H
Henry Irick Budd, Jr.,	Mt. Holly, N. J.,	1 N M R H
† Charles Perry Campbell,	Centerville, Iowa,	Mr. Brown's
Ernest Trow Carter,	Orange Valley, N. J.,	8 W M W H
Russell Carter,	Montclair, N. J.,	13 S W
James Robb Church,	Washington, D. C.,	3 S R H
Hector William Cowan,	Hobart, N. Y.,	11 N M R H
Calvin Bradley Crafts,	Tallahassee, Fla.,	50 U H
Winthrop More Daniels,	Dayton, O.,	1, U H
Hugh Trowbridge Dobbins,	West Berkeley, Cal.,	10 N E
Frederick L. Drummond,	Newark, N. J.,	9 S R H
Livingston Farrand,	Newark, N. J.,	26 S E H
John Fieldhouse Fenton,	Trenton, N. J.,	2 N R H
William Holmes Forsyth,	Princeton, N. J.,	39 U H
John Fraser, Jr.,	Philadelphia,	2 N E H
William Fryling,	Newark, N. J.,	11 N
Kemper Fullerton,	Georgetown, D. C.,	6 N W

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† Under conditions.

James Diverty Godfrey,	Millville, N. J.,	12 N W
Robert Halstead,	Cincinnati, O.,	7 S W
Thomas Benton Hamilton,	Columbus, O.,	49 U H
James Hancock,	Philadelphia,	5 W M W H
Osmund Howard Harvey,	Baltimore, Md.,	17 W W H
Charles James Hatfield,	Pottstown, Pa.,	7 N R H
Benjamin V. D. Hedges,	Chester, N. J.,	12 S E
E. Hicks Herrick,	New York City,	7 E M W H
Samuel Colgate Hodge,	Hartford, Conn.,	7 N R H
William Ledyard Hodge,	Washington, D. C.,	3 S R H
Edwin Mortimer Hopkins,	Carmel, N. Y.,	19 N E
George Wallace Hutchinson,	Windsor, N. J.,	14 S E
William Mann Irvine,	Bedford, Pa.,	10 N M R H
William Hallock Johnson,	New York City,	13 S E
Charles Leonard Jones,	Allegheny, Pa.,	7 S M R H
Samuel J. King,	Washington, D. C.,	7 N M R H
Robert Hutchinson Kirk,	Lancaster, Pa.,	4 S M R H
Frederick Jay Knox,	Bloomfield, N. J.,	13 S W
Charles Williston McAlpin,	New York City,	12 W W H
Thos. Nesbitt McCarter, Jr.,	Newark, N. J.,	6 N M R H
Charles F. W. McClure,	Boston, Mass.,	5 W M W H
Robert Winters McGregor,	Dayton, O.,	1, U H
Porter Robert McMaster,	Greenwich, N. Y.,	13 N W
George Whitfield MacMillan,	Perrineville, N. J.,	15 N M R H
John McMillan,	Pittston, Pa.,	19 S E
Howard McWilliams,	Brooklyn, N. Y.,	4 W W H
Richard Waln Meirs,	Hornerstown, N. J.,	7 S E
Ulysses Mercur,	Towanda, Pa.,	8 E M W H
Andrew Harold Miller,	Philadelphia,	Mrs. Voorhees'
Junius Spencer Morgan, Jr.,	New York City,	16 W W H
Archibald Robertson Osmer,	Franklin, Pa.,	12 N M R H
Thomas Marc Parrott,	Dayton, O.,	6 N R H
James Hammond Pershing,	Stauffer, Pa.,	16 S E
T. McClure Peters,	New York City,	8 E M W H
†Daniel Walter Phelan,	Los Angeles, Cal.,	61 U H
Celsus Pomerene,	Berlin, O.,	Mrs. King's
Lister Pomerene,	Berlin, O.,	Mrs. King's

# JUNIORS.

28

Luther Edmunds Price,	Cape May City, N. J.,	16 S W
William Cozens Price,	Cape May City, N. J.,	16 S W
Ralph Earl Prime, Jr.,	Yonkers, N. Y.,	15 S E
Evans Tulane Richardson,	Staunton, Va.,	17 S M R H
Elliott Verne Richardson,	New York City,	9 N E H
Jacob Riegel,	Philadelphia,	14 W W H
Peter Rioseco,	Philadelphia,	14 N M R H
William Courtland Robinson,	Delhi, N. Y.,	13 N W
Walter Willard Ross,	Hamilton, Mo.,	6 W M W H
William Henry Runyon,	Millington, N. J.,	16 S E
George E. Scott,	Newark, N. Y.,	8 N R H
†William L. Sidler,	Danville, Pa.,	18 S W
Charles Alvin Smith,	Philadelphia,	10 N E H
Charles Sidney Smith,	Washington, D. C.,	Mr. Hudnut's
William Emery Studdiford,	Trenton, N. J.,	5 S R H
Arthur Pemberton Sturges,	New York City,	8 E W H
James Frederick Talcott,	New York City,	15 W W H
John Benton Thomas,	Princeton, N. J.,	Mr. Thomas'
Stephen G. Thomas,	Princeton, N. J.,	Mr. Thomas'
Charles W. Van Dyke,	Cranbury, N. J.,	19 N W
Geo. B. Westcott Van Dyke,	Cranbury, N. J.,	19 N W
Elwood O. Wagenhurst,	Clifton, Pa.,	12 N W
Frank Allan Waterman,	Fulton, N. Y.,	14 S E
William Wisner White,	Summit, N. J.,	10 N E
Charles Barnes Williams,	Uniontown, Pa.,	8 N E H
Teunis Williamson,	Flatbush, N. Y.,	6 W M W H
Walter Augustus Wyckoff,	Punjab, India,	6 N W
Edward Yeomans,	Orange, N. J.,	19 N E H

SENIORS. . . . . 90.

# JUNIOR CLASS.

Maitland Alexander,	New York City,	10 S E
William Patterson Atkinson,	Philadelphia,	15 S E H
Thomas Leroy Aughinbaugh,	Pittsburgh, Pa.,	Mr. J. Durner's
Richmond Ogston Aulick,	Washington, D. C.,	5 S W
Andrew Banks,	Mifflin, Pa.,	10 N R H

Alfred Hamilton Barr,	Dillsburg, Pa.,	10 N R H
Samuel McKean Bayard,	Germantown, Pa.,	20 N W
Eugene Walker Belknap,	Newburgh, N. Y.,	3 E M W H
David Bovaird, Jr.,	Bradford, Pa.,	3 W W H
R. Desha Breckinridge,	Lexington, Ky.,	16 E W H
John Milton Brooks,	Cleveland, O.,	10 E M W H
J. Prentiss Browning,	Cooperstown, N. Y.,	2 W M W H
Arthur Audley Brownlee,	Indiana, Pa.,	7 N W
Charles Kynett Carpenter,	New York City,	75 U H
G. Herbert Carter,	Huntington, N. Y.,	31 N E H
William S. Chase,	Akron, O.,	9 W M W H
Isaac Parker Coale,	Arch Spring, Pa.,	10 S E H
Henry Workman Conner,	Charleston, S. C.,	11 and 12 U H
James Denis Denègre,	St. Paul, Minn.,	11 N E
Harry Gurnee Drummond,	Newark, N. J.,	9 S R H
William Edward Durell,	Woodstown, N. J.,	17 N E
J. Seymour Emans,	Poughkeepsie, N. Y.,	21 S E H
Llewellyn Stover Fulmer,	Philadelphia,	20 U H
Sidney Dale Furst,	Lock Haven, Pa.,	12 N E
James O. Gayley,	Philadelphia,	11 N E H
William James George,	Scroggsfield, O.,	6 N E
Joshua Brush Gesner,	Linden, N. J.,	8 N R H
George E. Gillespie,	Elizabeth, N. J.,	7 N M R H
Malbone Watson Graham,	Dubuque, Iowa,	4 N M R H
J. Charles Gray,	Washington, D. C.,	14 and 15 U H
Norman Grey,	Salem, N. J.,	25 S E H
Alexander Reading Gulick,	Princeton, N. J.,	24 N
Albert Halstead,	Cincinnati, O.,	8 S W
Edward Ringwood Hewitt,	New York City,	20 E W H
†James Hunter,	New York City,	6 N E
Harry Clay Irons,	Lakewood, N. J.,	9 N R H
William Sherman Jenney,	Syracuse, N. Y.,	8 E M W H
Frank Snowden Katzenbach, Jr.,	Trenton, N. J.,	5 N R H
Victor Kauffman,	Washington, D. C.,	10 N W
William Howard King,	Princeton, N. J.,	Mrs. King's
Furman Kneeland,	Brooklyn, N. Y.,	11 N E
Robert Henry Life,	Rye, N. Y.,	24 N



Alvin Carr McCord,	Minneapolis, Minn.,	7 S E H
†David Walter McCord,	Minneapolis, Minn.,	7 S E H
George Grenville Merrill,	New York City,	Mr. Goldie's
William Laing Merrill,	New York City,	Mr. Goldie's
Frederick Shepard Minot,	New York City,	6 S W
Clarence Blair Mitchell,	Lakewood, N. J.,	13 W W H
Lewis S. Mudge,	Princeton, N. J.,	Dr. Mudge's
Fred Neher,	Troy, N. Y.,	5 N R H
Henry Graves Noel,	St. Louis, Mo.,	5 S M R H
William M. Paxton, Jr.,	Princeton, N. J.,	2 E W H
Clifford Chandler Pollison,	Waverly, N. J.,	17 N W
John Williams Proudfit,	Baltimore, Md.,	17 E W H
†Edmund F. Quinn,	Eaton, O.,	13 S M R H
Edward Watson Rand,	Baltimore, Md.,	9 S E
Edmund Yard Robbins,	Asbury Park, N. J.,	16 N
Philip Ashton Rollins,	Philadelphia,	17 U H
Thomas Henry Powers Sailer,	Philadelphia,	10 S M R H
William Hodges Scofield,	Budd's Lake, N. J.,	25 N
Willard Blossom Segur,	Pittsfield, Vt.,	7 N E H
Irenaeus M. Shepherd,	Trenton, N. J.,	20 U H
J. Condit Smith,	Fredonia, N. Y.,	N, U H
William Walter Smith,	New York City,	17 N
Robert Eliot Speer,	Huntingdon, Pa.,	19 W W H
Gormly J. Sproull,	Brooklyn, N. Y.,	10 S R H
Thomas Sproull,	Brooklyn, N. Y.,	10 S R H
James Frederick Stebbins,	Geneva, N. Y.,	12 N E
Charles Wadham Stevens,	New York City,	14 and 15 U H
Duncan Warren Taylor,	Princeton, N. J.,	Mrs. Taylor's
John Alvin Terhune,	Saddle River, N. J.,	9 S E
David Ripley Todd,	Altamont, Kan.,	5 S E H
John Reynard Todd,	Altamont, Kan.,	5 S E H
C. Doremus VanWagenen, Jr.,	New York City,	13 U H
Howard Crosby Warren,	Montclair, N. J.,	10 E M W H
Bertram Howard Waters,	Pittsburgh, Pa.,	6 S R H
†Thomas Brown Whitney,	Philadelphia,	Mrs. Lavake's
Louis Wildman Wickham,	Norwalk, O.,	9 W M W H
James Edwards Wyckoff,	Punjab, India,	19 S W

## SOPHOMORE CLASS.

Benjamin Haywood Adams,	Elizabeth, N. J.,	3 N R H
†Walter Akerman,	Cartersville, Ga., Mrs. Carpenter's	
Henry Martyn Alexander, Jr.,	New York City,	6 S E
Horace Leon Allen,	Jersey City, N. J., Mrs. Warren's	
Knowlton Lyman Ames,	Chicago, Ill.,	8 U H
†Frank S. Anthony,	Springfield, O., Mrs. Carpenter's	
†Arthur Sterling Auchincloss,	Orange, N. J.,	4 W M W H
Alfred S. Baker,	Princeton, N. J., Trinity Rectory	
James McClure Barnett,	New Bloomfield, Pa.,	15 S M R H
Edgworth Bird Baxter,	Sparta, Ga., Mrs. Lavake's	
George Greene Belt,	Cedar Rapids, Iowa,	13 N M R H
Charles G. Bickham,	Dayton, O.,	16 N W
George Hooper Bigelow,	San Francisco, Cal.,	40 N E H
J. Warren Bird,	Trenton, N. J.,	9 N W H
Clinton Ledyard Blair,	Belvidere, N. J.,	16 E W H
Ernest Ludlow Bogart,	Yonkers, N. Y.,	38 U H
Charles L. Brackett,	Minneapolis, Minn.,	28 & 29 S E H
John Bright,	Pottsville, Pa.,	34 S E H
Thomas Brown, Jr.,	Princeton, N. J., Mr. Brown's	
John Calvin Bucher,	Dillsburg, Pa.,	14 S M R H
Edward Phillips Burgess, Jr.,	Dedham, Mass.,	A, U H
C. Sheldon Carothers,	Greason, Pa.,	Miss Leigh's
Dan Dillon Casement,	Painesville, O.,	11 W W H
Tileston Fracker Chambers,	Washington, D. C.,	18 U H
Henry Judson Chapin, Jr.,	New York City,	4 N R H
James Jeffries Charlton,	Albany, Oreg.,	13 N
Albert Ward Cobb,	Sing Sing, N. Y.,	10 W M W H
Addison Berg Collins,	Philadelphia,	24 S E H
Arthur James Collins,	Sheridan, N. Y.,	10 N M R H
William Shubael Conant,	Princeton, N. J.,	14 S W
John Paul Conduit,	Nutley, N. J.,	23 N E H
George Bishop Covington,	Snow Hill, Md., Mrs. Cochrane's	
John Frederick Degener, Jr.,	New York City,	F, U H
Henry Kreider Denlinger,	Gordonville, Pa.,	26 N
Walter Charles Dohm,	Princeton, N. J.,	Mr. Dohm's
George Curtis Doolittle,	Toledo, O.,	Mr. Hankins'

David Linn Edsall,	Hamburg, N. J.,	2 E M W H
Richard Everett Edsall,	Hamburg, N. J.,	2 E M W H
William Bradford Ewing,	Alexandria, Egypt,	18 S M R H
James Edward Farnam,	Media, Pa.,	9 W W H
James McCullough Farr, Jr.,	New York City,	24 N E H
Stephen Church Flinn,	Albany, Oreg.,	18 N
William Sanderson Furst,	Bellefonte, Pa.,	79 U H
†George McFarlane Galt,	Aurora, Ill.,	Mr. Dohm's
Herbert Mortimer Gesner,	Linden, N. J.,	5 N M R H
William Dwight Gibby,	Princeton, N. J.,	Mrs. Gibby's
Malcolm Graham, Jr.,	New York City,	10 W W H
Craig Reasoner Guerin,	Morristown, N. J.,	4 E M W H
Alexander Smith Guffey,	Greensburg, Pa.,	17 and 20 S E H
Harry Walter Haring,	Philadelphia,	22 S E H
Harlie Wallace Hathaway,	Jersey City, N. J.,	Mrs. Priest's
George Edward Hersh,	York, Pa.,	40 U H
Jacob Benner Hillegass,	Pennsburg, Pa.,	39 S E H
Jesse Watson Hirst,	Fall River, Mass.,	Mrs. McCarthy's
Charles Hodge,	Wilkes-Barre, Pa.,	7 S R H
Richard Irvin,	Troy, N. Y.,	9 S M R H
Charles Huntington Jackson,	Newark, N. J.,	11 N W
Hugh Hartshorne Janeway,	New Brunswick, N. J.,	1 E W H
Joseph Reynolds Kerr, Jr.,	New York City,	10 E W H
Winfield Smith Kimball,	Eatontown, N. J.,	Mrs. Warren's
*Fred. John Krapp,	Buffalo, N. Y.,	18 N E H
David Chambers Lewis,	Portland, Oreg.,	7 N E
Joseph William Lewis, Jr.,	St. Louis, Mo.,	35 and 36 U H
†Albert Elmer Linder,	Orwigsburg, Pa.,	Mrs. Warren's
Louis Eugene Livingood,	Reading, Pa.,	10 U H
Walter Lowrie,	Philadelphia,	15 S W
Frank Lukens,	Elizabeth, N. J.,	8 S R H
William Harvey Lytle,	Princeton, N. J.,	Dr. Lytle's
Henry Alexander McConkey,	Peach Bottom, Pa.,	9 N R H
Mark Lindsey McDonald, Jr.,	Santa Rosa, Cal.,	19 E W H
James McDougall,	York, Pa.,	Mrs. Hubbard's

\*Died, October 7th, 1887.

† On trial.

Andrew Hartupée McKee,	Allegheny, Pa.,	3 and 4 U H
Malcolm McLaren,	Brooklyn, N. Y.,	28 S E H
James Mathers,	Mifflintown, Pa.,	19 U H
Huntington Wolcott Merchant,	Astoria, N. Y.,	Mrs. Newton's
†Dunlop Moore, Jr.,	N. Brighton, Pa.,	Mr. Burroughs'
V. Van Arsdale Nicholas,	Somerville, N. J.,	15 N E H
Edwin Nicodemus,	Boonsboro', Md.,	B, U H
Newton Fassett Osmer,	Franklin, Pa.,	12 N M R H
Franklyn Paddock,	New York City,	7 W W H
Frank Palmer,	Swampscott, Mass.,	79 U H
Howard W. Perrin,	Luzerne, Pa.,	Mrs. Priest's
William Lee Phelps,	Springfield, O.,	32 U H
Delavan Leonard Pierson,	Philadelphia,	18 S E H
Eugene Blackburn Price,	Cincinnati, O.,	33 U H
William Cowper Prime,	Yonkers, N. Y.,	15 S E
Alfred Charles Post Quimby,	Jersey City, N. J.,	20 E W H
John H. Race,	Kingston, Pa.,	Mrs. Priest's
Edmund Grindall Rawson, Jr.,	Albany, N. Y.,	8 S M R H
Albert Reid,	Englishtown, N. J.,	12 N E H
William Mapes Rysdyk,	Goshen, N. Y.,	38 N E H
James Madison Sharon,	McAlisterville, Pa.,	18 S W
George Louis Shearer,	San Francisco, Cal.,	27 N
Spencer Howell Shepard,	New York City,	3 W M W H
Robert Porter Shick,	Reading, Pa.,	17 S W
Reginald Kearney Shober,	Philadelphia,	14 N E
Arthur Melville Shradý,	New York City,	11 S W
Edwin Withers Shultz,	Kirkwood, Pa.,	87 S E H
Louis Dean Speir,	South Orange, N. J.,	5 N W
Charles George Sproull,	Jacksonville, Fla.,	3 S E H
†D. Franklin Stakes,	Germantown, Pa.,	1 S M R H
Morris Crater Sutphen,	Morristown, N. J.,	21 N E H
Joseph Holden Sutton,	New York City,	18 N W
Joseph N. Thomas,	Santa Rosa, Cal.,	19 E W H
Robert T. Townsend,	New Brighton, Pa.,	6 S R H
J. Spencer Van Cleve,	Erie, Pa.,	10 S W
James Ditmars Voorhees,	Morristown, N. J.,	1 E M W H
Frederick Morton Wall,	New York City,	4 S E H

Frederick John Watson,	Cairo, Egypt,	5 N E H
Grant Weidman, Jr.,	Lebanon, Pa.,	15 N W
George Silas West,	Waverly, N. Y.,	19 S E H
Charles Albert Woods,	Pittsburgh, Pa.,	1 U H
Howard Wright,	Princeton, N. J., Mr. J. Wright's	
John Hankins Wright,	Princeton, N. J., Mr. T. Wright's	
J. Morris Yeakle,	Norristown, Pa.,	20 N E
Stuart R. Young,	Louisville, Ky.,	1 S R H

SOPHOMORES, . . . . . 116

## FRESHMAN CLASS.

†John Franklin Adams,	Mount Union, Pa., Mrs. Carpenter's	
Louis Bartholemew Adams,	New York City,	38 S E H.
Cornelius Rea Agnew, Jr.,	New York City,	Mr. Goldie's
George Bliss Agnew,	New York City,	Mr. Goldie's
W. Fessenden Allen,	New York City,	Mr. Goldie's
Wilson Aull,	St. Louis, Mo.,	17 S E
†Campbell Elias Babcock,	Chicago, Ill., Mrs. Carpenter's	
Samuel Harbourne Baldwin,	Newark, N. J.,	72 and 78 U H
Harry Wills Barkley,	Baltimore, Md.,	14 S W
George Jeffery Bergen,	Camden, N. J., Mrs. Anderson's	
James Bishop, Jr.,	Trenton, N. J., Mr. Bishop's	
William B. Blackwell,	Trenton, N. J., Mrs. Warren's	
Paul Russell Bonner,	New York City, Mrs. Anderson's	
Curtis Orris Bosserman,	Newport, Pa.,	8 S E H.
Willard Hall Bradford,	Dover, Del., Mrs. King's	
William Christy Bryan,	St. Louis, Mo., Mr. Dohm's	
Paul Van Ettan Cary,	Milwaukee, Wis.,	42 U H
Willie Winfield Casselberry,	Pottstown, Pa.,	R, U H
Theodore W. Church,	Hudson, N. Y.,	20 S E
†Christopher Walter Collier,	Warwick, Mass., Mrs. Zanes'	
Ernest Bonner Cooper,	Shelbyville, Tenn.,	9 U H
Charles Carroll Dana,	Morrisville, N. Y.,	V, U H
Herman Stearns Davis,	Milford, Del., Mrs. Carpenter's	
William Leek Davison,	Brooklyn, N. Y., Mr. Brown's	
William Russell Deemer,	Williamsport, Pa., Mrs. Rogers'	

Claire H. Denman,	Scottsville, N. Y., Mrs. McCarthy's
Alfred Pearce Dennis,	Pocomoke City, Md., 20 N E
†George Dugan,	Philadelphia, Mr. Thomas'
James Henry Dunham,	Trenton, N. J., Mr. Wright's
Harry L. Durell,	Woodstown, N. J., 17 N E
Samuel Russell Dye,	Trenton, N. J., 16 S M R H
Elvin Randolph Edmundson,	Pittsburgh, Pa., 64 and 65 U H
Edward Waterman Evans, Jr.,	Trenton, N. J., Mr. Wright's
William Littell Everitt,	Jamesburg, N. J., Mrs. B. Warren's
Harry Kerr Freeman,	Huntingdon, Pa., Mrs. Warren's
Clarence McCheyne Gordon,	Fannetsburg, Pa., Mrs. Warren's
†Ralph Laurie Erskine Graham,	Philadelphia, 86 S E H
Henry W. Green,	Trenton, N. J., Mrs. Lavake's
John Tayler Halsey,	Brooklyn, N. Y., 4 N E H
†A. Scott Harris,	Bellefonte, Pa.,
Joseph Webb Harper,	Still Pond, Md., Mrs. Carpenter's
William Henry Hensel,	Philadelphia, 83 S E H
William Post Herrick,	New York City, 7 E M W H
John Hone, 8d.,	Red Bank, N. J., Mrs. Stonaker's
John Preston Hoskins,	Media, Pa., Mrs. Ferguson's
Edward Leavitt Howe,	Princeton, N. J., Mr. Ed. Howe's
Charles Fish Howell,	Cranbury, N. J., 25 N E H
Charles M. Jamison,	Greensburg, Pa., 17 and 20 S E H
David S. Dodge Jessup,	Beirut, Syria, 28 Brown Hall
Benjamin Franklin Jones, Jr.,	Allegheny, Pa., 11 E W H
Pringle Carlisle Jones,	South Charleston, O., 4 E M W H
Phineas Barbour Kennedy,	Bridgeton, N. J., 16 S M R H
John Carruthers Leach,	Philadelphia, Mrs. Warren's
Edwin Augustus Stevens Lewis,	Hoboken, N. J., 7 W M W H
Richard Bruff Lyon,	Morristown, N. J., 5 E W H
Donald McColl,	Caledonia, N. Y., Mrs. Stockton's
Glenn Ford McKinney,	Titusville, Pa., T, U H
George Stewart McLean,	Shippensburg, Pa., 74 U H
Charles Hodge MacMillan,	Perrineville, N. J., 15 N M R H
Thomas Ferguson McNair,	Hazleton, Pa., 41 N E H
Hugh McNinch,	Grovania, Pa., Mrs. Rogers'
†James Alexander Matheson,	Philadelphia,

James Cowden Meyers,	Columbia, Pa.,	R, U H
Homer Ramsdell Miller,	Amity, N. Y.,	42 N E H
†Mushegh M. Minassian,	Constantinople, Turkey,	42 S E H
John Cameron Motter,	New Buffalo, Pa.,	18 S W
Archibald Gordon Murray,	New York City,	86 N E H
Samuel Grant Oliphant,	Woodstown, N. J., Mrs. Waibel's	
Otho Alvin Ormond,	Elderton, Pa.,	2 S M R H
Henry Page, Jr.,	Princess Anne, Md., Mrs. Burroughs'	
George Jacobs Parker,	Mifflintown, Pa.,	19 U H
William McCready Parker,	Oil City, Pa.,	14 S E
William Wilson Parker,	Mifflintown, Pa.,	
George Stevenson Patton,	Princeton, N. J., Prof. Patton's	
Harmer Denny Paxton,	Princeton, N. J.,	2 E W H
Frank Hervey Payne,	Titusville, Pa.,	T, U H
Nelson Lane Petty,	Trenton, N. J., Mrs. Warren's	
Edgar Allan Poe,	Baltimore, Md.,	7 W M W H
Daniel Warren Poor, Jr.,	Philadelphia,	40 S E H
Benedict Lincoln Prieth,	Newark, N. J.,	72 and 73 U H
Edward R. Proctor,	Germantown, Pa., Mr. Thomas'	
Frank Webster Propst,	Albany, Oreg., Mrs. Burroughs'	
Charles Elbert Rhodes,	So. Schodack, N. Y.,	8 S M R H
William Richards Ridington,	Lansdale, Pa.,	89 N E H
Robert S. Robertson,	Cortland, N. Y., Mrs. Anderson's	
Joseph Haswell Robinson,	New York City, Mrs. Carpenter's	
Thos. Hastings Robinson, Jr.,	Allegheny, Pa., Mrs. Stonaker's	
†Joseph Stockton Roddy,	New Bloomfield, Pa.,	16 S E H
Samuel Semple,	Philadelphia,	18 N
Charles Arthur Sidler,	Danville, Pa.,	85 N E H
William Cornman Spicer,	Harrisburg, Pa.,	1 S E H
Arthur Willing Spruance,	Wilmington, Del.,	63 U H
†George Herbert Stephens,	Montrose, Pa., Mrs. Ferguson's	
James Weaver Sterry,	New York City,	14 E W H
†Charles Smith Stevens,	Cape May City, N. J., Mrs. Zanes'	
Robert Stuart Stewart,	Detroit, Mich.,	S, U H
Hanson Corning Stone,	Morristown, N. J.,	14 E W H
Robert Boorman Strong,	New Brunswick, N. J., Mr. Thomas'	
†William Stump,	Bel Air, Md., Miss Leigh's	

Thomas Edward Van Ausdal,	Dayton, O.,	16 N W
Ambrose White Vernon,	Morristown, N. J.,	60 U H
Harwood Vernon,	Summit, N. J.,	60 U H
George Riddle Wallace,	Norfolk, Va.,	64 and 65 U H
Robert Benson Wallace,	Harrisburg, Pa.,	39 U H
†James Hitchcock Wardwell,	S. Orange, N. J., Mrs. Carpenter's	
Crowley Wentworth,	Randolph, N. Y., Mrs. Lavake's	
George P. Wheeler,	Philadelphia,	80 U H
Charles Dunning White,	Summit, N. J., Mrs. Wolfe's	
Harry White,	Eatontown, N. J.,	1 N E H
William Silas Whitehead,	Newark, N. J.,	13 S E H
Alan Dickson Wilson,	Philadelphia,	15 S W
Lawrence C. Woods,	Pittsburgh, Pa.,	1 U H
Alfred Beaver Yeomans,	Orange, N. J.,	17 N E H

FRESHMEN, . . . . . 113

## SPECIAL STUDENTS.

## NOT CANDIDATES FOR A DEGREE.

Gordon M. Ash,	Philadelphia,	8 W W H
Alexander N. Bodine,	Philadelphia,	18 E W H
William Joseph Broadwell,	Kansas City, Mo.,	11 & 12 U H
Edw. Landseer Boyle,	Memphis, Tenn.,	Mr. Thomas'
Daniel I. Camp,	Hightstown, N. J.,	16 N
William Frederick Dix,	Newark, N. J.,	5 E M W H
Alfred Sherman Hartz,	Peoria, Ill.,	2 S E H
Stanley Carnahan Hughes,	Richmond, Ind.,	Mrs. Dohm's
Henry Arthur Inman,	Atlanta, Ga.,	G, U H
John Walter Inman,	Atlanta, Ga.,	K, U H
William Herron McCulloch,	Peoria, Ill.,	62 U H
Haughton Murray,	Princeton, N. J., Prof. Murray's	
Isaac Nakagawa,	Tokio, Japan,	41 S E H
John Van Ness Philip,	Washington, D. C.,	6 E W H
Bert Campbell Powers,	Cleveland, O.,	5 E M W H
Thomas Robins, Jr.,	Morristown, N. J., Mrs. Carpenter's	



# SUMMARY.

33

Harry Porter Robinson,	New York City,	20 N E H
John William Sanders,	Atlanta, Ga.,	K, U H
T. Liper Kane Shields,	Princeton, N. J.,	Mr. Bayard Stockton's
Lowry Witherspoon Sibbet,	Shippensburg, Pa.,	10 N
Dudley Almonte Smith,	Creston, O.,	Mrs. Easton's
F. Berkeley Smith,	New York City,	Mr. Priest's
Garret Voorhees Stryker,	Rocky Hill, N. J.,	9 S E H
Orville C. Taintor,	S. Orange, N. J.,	Mrs. Carpenter's
Ferris S. Thompson,	New York City,	15 E W H
James Ruggles Thorpe,	Minneapolis, Minn.,	9 E M W H
Samuel Skidmore Thorpe,	Minneapolis, Minn.,	9 E M W H
Harry Walter Tolson,	Philadelphia,	22 N E H
John Worthington Valliant,	St. Louis, Mo.,	5 U H
Thomas White,	Indiana, Pa.,	7 N W

SPECIALS, . . . . . 30

# SUMMARY.

SENIORS, . . . . .	90
JUNIORS, . . . . .	79
SOPHOMORES, . . . . .	116
FRESHMEN, . . . . .	118
SPECIALS, . . . . .	30
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THE  
JOHN C. GREEN SCHOOL OF SCIENCE.

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JAMES McCOSH, PRESIDENT.

JAMES O. MURRAY, DEAN, *English Literature and Language*.

J. STILLWELL SCHANCK, *General Chemistry*.

CYRUS F. BRACKETT, *Physica*.

HENRY B. CORNWALL, *Analytical Chemistry and Mineralogy*.

GEORGE MACLOSKIE, *Botany, Zoology, Biblical Instruction*.

CHARLES McMILLAN, *Civil Engineering*.

CHARLES A. YOUNG, *Astronomy*.

CHARLES G. ROCKWOOD, JR., *Mathematics*.

THEODORE W. HUNT, *Rhetoric, English Language*.

GEORGE L. RAYMOND, *Oratory and Aesthetic Criticism*.

WILLIAM LIBBEY, JR., *Histology*.

WILLIAM B. SCOTT, *Geology*.

HENRY F. OSBORN, *Comparative Anatomy*.

FREDERICK N. WILLSON, *Descriptive Geometry, Stereotomy,  
Technical Drawing*.

ALEXANDER T. ORMOND, *Psychology*.

ALEXANDER JOHNSTON, *Political Economy*.

HERMANN C. O. HUSS, *French, German*.

WILLIAM F. MAGIE, *Physics*.

H. S. S. SMITH, *Civil Engineering*.

MALCOLM McNEILL, *Practical Astronomy*.

LEROY W. McCAY, *Analytical Chemistry*.

JOHN W. PHILLIPS, *Biology*.

## UNDERGRADUATES.

### SENIOR CLASS.

I. Candidates for B. S.    II. Candidates for C. E.

I. Stephen Weart Blackwell,	Trenton, N. J.,	5 S R H
II. William J. J. Bowman,	Trenton, N. J.,	9 S E H
I. Homer E. Fraser,	Fowlerville, N. Y.,	8 N R H
I. Francis M. Frazer,	Newark, N. J.,	1 W M W H
II. Harry B. Goodwin, B. S.,	Bordentown, N. J.,	Mrs. Dohm's
II. Conrad Hewitt,	Trenton, N. J.,	3 E W H
I. Thomas E. Inslee,	Newton, N. J.,	15 N E
I. Frank Jones King,	Pittsburgh, Pa.,	44 and 45 U H
II. †John Elliot Nicholson,	New York City,	6 W W H
I. Thornton Floyd Turner,	Englewood, N. J.,	48 U H

SENIORS, . . . . . 10

### JUNIOR CLASS.

II. Jason Rogers Barr,	Louisville, Ky.,	9 S W
II. William Roscoe Bonsal,	Baltimore, Md.,	18 W W H
II. William Daniel Bratton,	Elkton, Md.,	H, U H
I. Byron S. Clarke,	Brooklyn, N. Y.,	2 W M W H
I. A. Edward Conover, Jr.,	New York City,	20 S W
I. George Kerr Edwards,	Washington, D. C.,	18 E W H
I. Theodore Granger Gordon,	Columbus, O.,	L, U H
II. George Louis Hall,	Bedford, Pa.,	L, U H
I. Thomas W. Hotchkiss, Jr.,	Elmira, N. Y.,	13 N E H
I. Chas. Jenkins Montgomery,	Augusta, Ga.,	Mrs. Fine's
II. Jos. Chandler Morris, Jr.,	New Orleans, La.,	18 N E
I. William Boswell Mount,	Philadelphia,	14 N E H
I. †Thomas Clarence Noyes,	Washington, D. C.,	12 S W
I. Cyrus Long Pershing,	Pottsville, Pa.,	18 S E
I. John Elliot Shradly,	New York City,	11 S W
II. Lewis Mudge Smith,	Princeton, N. J.,	Mrs. Smith's

JUNIORS, . . . . . 16.

† Under conditions.

## SOPHOMORE CLASS.

I.	Charles Jenney Chambers,	Philadelphia,	27 and 30 N E H
I.	Edwin A. Dalton,	LeMars, Iowa,	9 N E
I.	William Vance Dinsmore,	Bloomington, Ill.,	27 and 30 N E H
II.	Wilbur Chapman Fisk,	New York City,	12 E W H
II.	George Goldie, Jr.,	Princeton, N. J.,	Mr. Goldie's
I.	Frederick Wm. Hagney,	Newark, N. J.,	29 S E H
II.	†Albert O. Headley, Jr.,	Newark, N. J.,	6 E M W H
I.	Bernard Shea Horne,	Pittsburgh, Pa.,	E, U H
I.	Albert Gould Jennings,	Brooklyn, N. Y.,	4 S R H
I.	Albert Edward Kennedy,	Philadelphia,	8 W W H
I.	Paul Foster Leach,	Philadelphia,	Mrs. Warren's
II.	Chas. Richard McMillan,	Princeton, N. J.,	Prof. McMillan's
II.	William Passmore Meeker,	Newark, N. J.,	11 S M R H
I.	Charles Howard Miner,	Wilkes-Barre, Pa.,	7 S R H
I.	Frank John Newbury,	Lima, N. Y.,	19 N E
II.	Harry Otis Nutting,	Lebanon, Pa.,	14 N W
II.	William Pitt Nutting,	Lebanon, Pa.,	5 N E
II.	Howard Crathorne Phillips,	New York City,	8 N E H
II.	Frederic Vernon Pitney,	Morristown, N. J.,	Dr. Macdonald's
II.	George Van Dusen Rickert,	Pottsville, Pa.,	O, U H
I.	Charles K. Rodgers,	Springfield, O.,	46 U H
II.	Robert Lincoln Scudder,	Princeton, N. J.,	Mr. Scudder's
II.	Edgar Maverick Smith,	New York City,	68 and 69 U H
I.	Samuel Wood Thurber,	Syracuse, N. Y.,	85 S E H
I.	William Campbell Trusdell,	Newark, N. J.,	M, U H
II.	George Shreve Wilkins,	Mount Holly, N. J.,	3 N M R H
I.	Frank Scott Willock,	Pittsburgh, Pa.,	16 U H

SOPHOMORES, . . . . . 27

## FRESHMAN CLASS.

II.	James Barnes,	New York City,	P, U H
II.	Frank Brown,	Philadelphia,	41 U H
II.	John Ralph Burt,	Detroit, Mich.,	U, U H
II.	Roscoe Henry Channing, Jr.,	Plainfield, N. J.,	Mrs. Easton's
I.	Joseph Walter Cooper,	Camden, N. J.,	D, U H

II. Halsey Durand,	Newark, N. J.,	70 and 71 U H
I. Radclyffe Furness,	Philadelphia,	Mrs. Wolfe's
II. Arthur Buckingham Gladwin,	Leonida, N. J.,	66 U H
I. Edwin Bates Harts,	Springfield, Ill.,	Mrs. Anderson's
II. William Lapidge Hedenberg,	Newark, N. J.,	70 and 71 U H
I. Charles Arbuckle Jamison,	Allegheny, Pa.,	Mrs. Killoran's
I. Clarence Edward Lemassena,	Newark, N. J.,	1 W W H
I. Charles Thomas Mixer,	Chicago, Ill.,	Prof. Young's
I. †Ben Luker Morgan,	Freedom, Pa.,	Mrs. Killoran's
II. Theodore Pesinger Payne,	Sayville, N. Y.,	Mrs. Ferguson's
I. †Hugh Bertram Reed,	Somerville, N. J.,	80 S E H
I. John Hutchings Sealy,	Galveston, Tex.,	Mrs. Easton's
I. William Floyd Sicard,	Washington, D. C.,	Mrs. Hubbard's
II. George Silver,	Tarrytown, N. Y.,	84 U H
I. Winfield Price Sully,	New York City,	Mrs. Easton's
II. Orville Griffith Waring,	Plainfield, N. J.,	31 U H
II. Robert Anderson Watts,	Louisville, Ky.,	1 S R H
II. Charles Edgar Zortman,	Lancaster, Pa.,	Mr. Thomas'

FRESHMEN, . . . . . 23

### SPECIAL STUDENTS.

II. Andrew Jackson Allen,	Blairstown, N. J.,	27 S E H
I. Stephen Leland Dows, Jr.,	Cedar Rapids, Iowa,	18 N M R H
I. Horace Wardner Eggleston,	Brooklyn, N. Y.,	2 S E H
I. Arthur Daniel Forst,	Trenton, N. J.,	15 N E H
II. John Calvin Graham, Jr.,	Montgomery, Ala.,	8 N E
I. Paul Percy Harris,	Wallingford, Vt.,	Mrs. Wolfe's
I. Russell Lee Jones,	Farmington, Conn.,	Mrs. Cochrane's
II. Curtis Edward Knickerbocker,	Morrisville, N. Y.,	V, U H
II. Gilbert N. McMillan,	Detroit, Mich.,	6 and 7 U H
I. Frank Seymour Miller,	Elmira, N. Y.,	16 N E
II. Arthur Gardner Moses,	Trenton, N. J.,	2 U H
II. Charles Pope O'Fallon,	St. Louis, Mo.,	35 and 36 U H
I. H. Russell Pemberton,	Richmond, Va.,	Mrs. Newton's

† On trial.

I. Henry Dorr Sill,	Cooperstown, N. Y.,	Mrs. Margerum's
II. James Ross Todd,	Louisville, Ky.,	C, U H
II. George Trotter,	New York City,	3 W M W H
II. Charles F. Uebelacker.	Morristown, N. J.,	1 E M W H
1. Forster Wingate Weeks,	Newark, N. J.,	9 E W H
I. John Zimmerman,	New Glarus, Wis.,	Mrs. Zanes'

SPECIALS, . . . . . 19

SUMMARY.

SENIORS, . . . . .	10
JUNIORS, . . . . .	16
SOPHOMORES, . . . . .	27
FRESHMEN, . . . . .	23
SPECIALS, . . . . .	19
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TOTAL, . . . . .	95

## GENERAL SUMMARY.

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FELLOWS, . . . . .	10
GRADUATE STUDENTS, . . . . .	78
ACADEMIC STUDENTS, . . . . .	428
SCIENTIFIC STUDENTS, . . . . .	95
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	611
NAMES REPEATED, . . . . .	8
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	603

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CLASSIFICATION OF UNDERGRADUATES BY  
RESIDENCE.

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New Jersey.....	144	Connecticut.....	2
Pennsylvania.....	133	Florida .....	2
New York.....	107	Indiana.....	2
Ohio .....	25	Kansas .....	2
District of Columbia.....	13	Tennessee .....	2
Maryland .....	13	Vermont .....	2
Illinois .....	8	Wisconsin .....	2
Missouri.....	8	Alabama .....	1
California .....	6	Louisiana .....	1
Georgia.....	6	Rhode Island .....	1
Minnesota.....	6	South Carolina.....	1
Iowa .....	5	Texas .....	1
Kentucky .....	5		
Massachusetts .....	5	Egypt.....	2
Oregon .....	4	India .....	2
Delaware.....	3	Japan.....	1
Michigan .....	3	Syria.....	1
Virginia.....	3	Turkey ..	1

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## ABBREVIATIONS.

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N, Nassau Hall.	E W H, East Entry of Witherspoon Hall.
N E, North Entry of East College.	W W H, West Entry of Witherspoon Hall.
S E, South Entry of East College.	E M W H, East Middle Entry of Witherspoon Hall.
N W, North Entry of West College.	W M W H, West Middle Entry of Witherspoon Hall.
S W, South Entry of West College.	N E H, North Entry of Edwards Hall.
N R H, North Entry of Reunion Hall.	S E H, South Entry of Edwards Hall.
S R H, South Entry of Reunion Hall.	U H, University Hall.
N M R H, North Middle Entry of Reunion Hall.	
S M R H, South Middle Entry of Reunion Hall.	

## HONORS AND DEGREES CONFERRED.

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### DEGREES.

#### *Honorary Degrees Conferred November 1886.*

LL.D.—Rev. William C. Roberts, D.D., Class of 1855, President of Lake Forest University, Illinois.

Ph.D.—John Gamble, Principal of Litton Springs Academy, California.

Edward D. Lyon, Class of 1876, New York.

John D. Davis, Class of 1879, Instructor in Princeton Theological Seminary, New Jersey.

A.M. —Edward S. Ellis, New Jersey.

#### *Honorary Degrees Conferred February 1887.*

LL.D.—His Excellency Robert Stockton Green, Class of 1850, Governor of New Jersey.

Ph.D.—William Baxter Owen, Professor in Lafayette College.

A.M. —Rev. Kajinosuke Ibuka, Professor in Theological Seminary, Tokio, Japan.

#### *Honorary Degrees Conferred June 1887.*

LL.D.—Hon. Stanley Matthews, Justice of the Supreme Court of the United States.

Barker Gummere, New Jersey.

D.D. —Rev. George Stockton Burroughs, Class of 1873, Professor in Amherst College, Massachusetts.

Rev. Henry P. Smith, Professor in Lane Theological Seminary, Ohio.



Ph.D.—Professor Robert Foster, Class of 1847, New York.  
 Professor Edward F. Reed, Illinois.  
 E. W. Coy, Principal of the Hughes High School,  
 Cincinnati, Ohio.  
 A.M. —Cyrus H. McCormick, Illinois.  
 John Mason Duncan, Maryland.

*Degrees in Course Conferred June 1887.*

Ph.D.—John Howell Westcott, A.M., Class of 1877.  
 Thesis—Some Peculiarities of Livy's Diction.  
 James Mark Baldwin, Class of 1884.  
 Thesis—Contemporary Materialism.

Masters of Arts . . . . .	57
Masters of Arts on examination . . . . .	9
Bachelors of Arts . . . . .	78
Bachelors of Science . . . . .	7
Civil Engineers . . . . .	5

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**HONORS—1886-87.**

**COMMENCEMENT HONORS.**

**MASTER'S ORATION.**

Alfred Gandy Reeves, New York.

**SENIOR HONORMEN.**

**FIRST GROUP—*Magna cum laude.***

Roger Bruce Cash Johnson, *Latin Salutatory.*

**SECOND GROUP—*Cum laude.***

With special excellence in particular departments indicated.

Francis Ellison Reid, *English Salutatory.*  
 Paul Matthews, *Valedictory.*

---

Robert William Blake, *Greek.*  
 Wilmot Albert Carrington. *International Law.*

Solomon Stanger Iszard,	<i>General Excellence.</i>
Charles Hill Macloskie.	
Peter McHarg McQueen,	<i>Metaphysics.</i>
James Paige,	<i>Political Economy.</i>
John Wahl Queen, Jr.,	<i>Philosophy.</i>
Clarence William Rouse,	<i>Classics.</i>
Alfred Hedges Scofield,	<i>Physical Science.</i>
Frank Hyatt Smith,	<i>History.</i>
Lucien Waggener, Jr.,	<i>Modern Languages.</i>
George Titus Berry, Samuel Thomson Dodd, George Livingstone Robinson, Francis Harding White, of the Third Group, and Robert William Mason, of the Fourth Group, also received Commencement orations.	

## FELLOWS.

(For names of Fellows see page 15.)

Francis Ellison Reid, a competitor for the Mathematical Fellowship, received honorable mention.

## SENIOR PRIZEMEN.

## ALEXANDER GUTHRIE MCCOSH PRIZE.

Edward Demoss Miller, West Virginia.

## CLASS OF 1859 PRIZE IN ENGLISH LITERATURE.

Frank Hyatt Smith, Michigan.

## THE GEORGE POTTS BIBLE PRIZES.

Wilmot A. Carrington, D. C.

George L. Robinson, New York.

## THE LYMAN H. ATWATER PRIZE IN POLITICAL SCIENCE.

John M. Jamison, Pennsylvania.

## LYNDE PRIZE DEBATE.

Franklin S. Spalding, Col., *First Prize.*

Francis H. White, D. C., *Second Prize.*

John Wahl Queen, Jr., N. J., *Third Prize.*

## DEBATERS.

*American Whig Society.*

James W. Doughty, O.  
 Frank H. Smith, Mich.  
 Franklin S. Spalding, Col.

*Philosophic Society.*

Samuel T. Dodd, N. Y.  
 John W. Queen, Jr., N. J.  
 Francis H. White, D. C.

## BAIRD PRIZEMEN.

The Baird Prize. Robert W. Mason, Ohio.  
 In Oratory. Paul Matthews, Ohio.  
 In Delivery. Peter McHarg McQueen, Scotland.  
 In Poetry. Mark Harvey Liddell, Pa.  
 In Disputation. James Paige, Minn., *First Prize*.  
 Samuel T. Dodd, N. Y., *Second Prize*.

*Competitors Appointed for Excellence in English Composition :*  
*For Baird Prize and Prize for Oratory*—R. B. C. Johnson, R.  
 W. Mason, P. Matthews, P. M. McQueen, J. W. Queen, Jr.,  
 G. L. Robinson, F. H. Smith, F. H. White. *For Prize for*  
*Oratory*—G. T. Berry, R. W. Blake, S. T. Dodd, E. M. Fitzger-  
 ald, S. S. Iszard, M. H. Liddell, J. Paige, A. G. Parker, F. E.  
 Reid, C. W. Rouse, A. H. Scofield, F. S. Spalding, J. L.  
 Van Schoick, L. Waggener, Jr.

## JUNIOR PRIZEMEN.

*Junior First Honor Scholar.*

Edwin M. Hopkins, New York.

*Maclean prizeman.*

Walter A. Wyckoff, India.

*Junior Orator Medalists.*

James H. Pershing, Pa., *First Medal*.  
 Chas. J. Hatfield, Pa., *Second Medal*.  
 A. Harold Miller, Pa., *Third Medal*.  
 Walter A. Wyckoff, India, *Fourth Medal*.

*Competing Junior Orators.**American Whig Society.*

Winthrop M. Daniels, O.  
 Chas. J. Hatfield, Pa.  
 William M. Irvine, Pa.  
 James H. Pershing, Pa.

*Philosophic Society.*

Livingston Farrand, N. J.  
 Benj. V. D. Hedges, N. J.  
 A. Harold Miller, Pa.  
 Walter A. Wyckoff, India.

**JUNIOR HONORMEN.***First Group.*

W. M. Daniels, O.  
 H. T. Dobbins, Cal.

E. M. Hopkins, N. Y.  
 W. H. Runyon, N. J.

*Second Group.*

E. T. Carter, N. J.  
 Russell Carter, N. J.  
 F. L. Drummond, N. J.  
 W. H. Forsyth, N. J.  
 William Fryling, N. J.

Kemper Fullerton, D. C.  
 W. H. Johnson, N. Y.  
 T. M. Parrott, O.  
 Peter Riosco, Pa.  
 C. S. Smith, D. C.

**SOPHOMORE PRIZEMAN.***Class of 1861 Prize.*

John Milton Brooks, Ohio.

With honorable mention of Henry G. Drummond, N. J.

**SOPHOMORE HONORMEN.***First Group.*

E. Y. Robbins, N. J.

Peddie Institute, Hightstown,  
 N. J.

R. E. Speer, Pa.

Phillips Andover Academy, Mass.

*Second Group.*

R. O. Aulick, D. C.,  
 David Bovaird, Jr., Pa.

St. John's School, Sing Sing, N. Y.  
 Geneseo State Normal School,  
 Geneseo, N. Y.

J. M. Brooks,

West High School, Cleveland, O.

G. H. Carter, N. Y.	Huntington Union School, Huntington, N. Y.
H. G. Drummond, N. J.	Newark Academy, N. J.
J. C. Gray, D. C.	Emerson Institute, Washington, D. C.
R. H. Life, N. Y.	Lawrenceville School, N. J.
L. S. Mudge, N. J.	H. N. Van Dyke and Princeton Preparatory School, N. J.
Fred Neher, N. Y.	Troy Academy, Troy, N. Y.
J. F. Stebbins, N. Y.	Geneva Class. and Union School, Geneva, N. Y.
H. C. Warren, N. J.	Charles M. Davis, Bloomfield, N. J.

#### SOPHOMORE HONORMEN, SCHOOL OF SCIENCE.

##### *B. S. Course.*

C. J. Montgomery, Ga.	University of Georgia.
B. S. Clarke, N. Y.	Brooklyn Collegiate and Polytechnic Institute, N. Y.

##### *C. E. Course.*

W. D. Bratton, Md.	G. A. Blake, Elkton, Md.
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#### FRESHMAN PRIZEMAN.

##### *Freshman First Honor Prize.*

Edward Phillips Burgess, Jr., Mass.

#### FRESHMAN HONORMEN.

##### *First Group.*

E. P. Burgess, Jr., Mass.,	Mr. Noble's School, Boston, Mass.
Frank Palmer, Mass.,	Mr. Noble's School, Boston, Mass.
R. P. Shick, Pa.,	Reading High School, Reading, Pa.

*Second Group.*

B. H. Adams, N. J.,	The Pingry School, Elizabeth, N. J.
E. B. Baxter, Ga.,	Lawrenceville School, N. J.
G. H. Bigelow, Cal.,	Westminster School, Rev. James Matthews, Prin., Cal.
D. D. Casement, O.,	Western Reserve Acad., Hudson, Ohio.
J. P. Conduit, N. J.,	Trinity School, Tivoli, N. Y.
W. S. Furst, Pa.,	Bellefonte Acad., Bellefonte, Pa.
W. D. Gibby, N. J.,	Princeton Preparatory School, N. J.
A. S. Guffey, Pa.,	Greensburg Seminary, Pa.
H. W. Hathaway, N. J.,	Jersey City High School, Jersey City, N. J.
J. R. Kerr, Jr., N. Y.,	M. W. Lyon's Collegiate Inst., N. Y.
H. W. Perrin, Pa.,	Wyoming Seminary, Kingston, Pa.
D. L. Pierson, Pa.,	Lawrenceville School, N. J.
E. W. Shultz, Pa.,	State Normal School, Millersville, Pa.
L. D. Speir, N. J.,	The Dearborn-Morgan School, Orange, N. J.
M. C. Sutphen, N. J.,	Morris Academy, Morristown, N. J.
J. D. Voorhees, N. J.,	Morris Academy, Morristown, N. J.
C. A. Woods, Pa.,	Sewickley Academy, Pa., and Rev. R. A. Benton.
J. M. Yeakle, Pa.,	Blair Presbyterian Academy, N. J.

**FRESHMAN HONORMEN, SCHOOL OF SCIENCE.**

II. F. V. Pitney, N. J.,	Morris Academy, Morristown, N. J.
I. W. V. Dinsmore, Ill.,	Lawrenceville School, N. J.
I. P. F. Leach, Pa.,	Mifflintown Academy, Pa., and C. C. Hays.

# ACADEMIC DEPARTMENT.

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## ADMISSION.

### ENTRANCE EXAMINATIONS.

All entering students on their arrival must report at the President's house, and register. Examinations for admission will be written, with supplementary oral examinations as needed. The first examination will commence in Princeton, on Thursday, June 21st, at 11 A. M., and will continue through the afternoon of Friday. The second will commence on Tuesday, September 11th, at 11 A. M., and continue through the afternoon of Wednesday. Applicants who have any conditions or other deficiencies from the June examination are required to remove them at this time. *Attendance is required at the beginning of the examinations.*

Simultaneously with the June entrance examinations in Princeton, examinations will also be held in the following cities, viz: Pittsburgh, Cincinnati, Louisville, Chicago, St. Louis, Omaha, Denver, San Francisco; and at preparatory schools and other cities when necessary. The precise places in which the examinations are to be held can be learned by application to the President. Due notice of these examinations will also be published in leading local newspapers for several weeks in advance.

Examinations at other times and places than those specified are inconvenient and often impracticable, and applicants for examination at other than the regular days are required to pay \$10 into the treasury.

### SUBJECTS.

Candidates for admission to the Freshman class are examined in the following books and subjects. It is recommended that the candidates be prepared for examination on the requirements as specified; but equivalents will be accepted.

### English.

English Grammar—Whitney, or Reed and Kellogg (Higher Lessons); Modern Geography—Guyot's Grammar-School Geography; U. S. History—Anderson's or Johnston's.

The writing of a short essay is required as a part of the examination; the theme for the essay of 1888 will be based on the life of Longfellow or of Thackeray.

The attention of preparatory schools is called to the need of a more thorough study of elementary English.

### Latin.

Latin Grammar; especially the inflections; the simpler rules for composition and derivation of words; syntax of cases and verbs and structure of the sentence in general, with particular regard to relative and conditional sentences, indirect discourse and the subjunctive; so much prosody as relates to accent, quantity, versification in general, and dactylic hexameter. Cæsar (five books of the Commentaries); Sallust (Catiline or Jugurtha); Virgil (six books of the *Æneid*); Cicero's Select Orations (six); Arnold's Latin Prose Composition (twelve chapters), or Jones' Exercises in Latin Prose; Geography of Ancient Italy.

### Greek.

Greek Grammar, including prosody; Xenophon (four books of the *Anabasis*), or Greek Reader (Goodwin's) 111 pages; Homer (the first two books of the *Iliad*, except the Catalogue of Ships); Greek composition (Jones' Exercises in Greek Prose, or an equivalent—writing with the accents required); Geography of Ancient Greece and Asia Minor. Goodwin's Grammar is preferred. Special stress is laid upon a thorough knowledge of the noun and verb inflections. Candidates will do well to read an additional book of the *Iliad*, where this can be done without sacrifice of thoroughness in the formal requisitions. Some experience in giving written answers to set questions is advantageous.

The Continental pronunciation of the vowels and diphthongs is preferred in both Latin and Greek.



### Mathematics.

Arithmetic, including the Metric system. Algebra, through quadratic equations involving two unknown quantities—including radicals, and fractional and negative exponents; Geometry, the first and second books of Euclid, or an equivalent—that is, the propositions in other text-books relating to the straight line and rectilinear figures, not involving ratio and proportion.

### PRELIMINARY EXAMINATIONS.

At the examinations in June and September, candidates intending to enter the Freshman class one year later are admitted, on request, to examination on a portion of the subjects required for entrance. Unless in exceptional cases, either two of the four general subjects, English, Mathematics, Latin, Greek, must be offered entire; or such parts of at least three subjects as are here prescribed, viz.: in *English*, Grammar and Geography; in *Mathematics*, Arithmetic, with the Metric system, and either Algebra, through simple equations of two unknown quantities, or the first and second books of Euclid; in *Latin*, the full amount in Cæsar and one other author, with Grammar; in *Greek*, three books of the Anabasis, with Grammar.

In both Latin and Greek Grammar the examination will be upon noun and verb inflections, syntax of nouns and the simpler rules for syntax of verbs. This examination will be partial only, to be completed the following year.

Applications for preliminary examinations should be made to the President, with a statement of the subjects and amount offered, at least two weeks previous to the examination.

### OTHER REQUIREMENTS.

Candidates for admission to the Sophomore class who have not completed the studies of the Freshman year at another College must first pass an examination on the studies required for admission to the Freshman class.

Candidates for admission to the Sophomore, Junior or Senior class, coming from another College, are examined only in the studies of the year preceding that which they wish to enter,

provided they present evidence that they have passed satisfactory examinations on the previous studies of the curriculum and entrance requirements, or their equivalents, excepting French, Anatomy, Botany and Zoology. Some knowledge of the studies just mentioned is desirable but is not required.

No person is admitted to the College as a candidate for the degree of Bachelor of Arts after the beginning of the first term of the Senior year.

All candidates for admission to any class, or as special students, must bring with them testimonials of moral character and attainments, preferably from their last instructors; and if the candidate has been a member of another college or university, he must produce a certificate from its President or Faculty that he is free from censure in that institution.

No candidate is admitted into the College without examination and a vote of the Faculty.

Immediately after the opening of the College the entering students meet according to announcement for the registration of their names and subscription to the following pledge, required by the Board of Trustees :

We, the undersigned, do individually for ourselves promise, without any mental reservation, that we will have no connection whatever with any secret society, nor be present at the meetings of any secret society in this or any other college so long as we are members of the College of New Jersey; it being understood that this promise has no reference to the American Whig and Cllosophic Societies. We also declare that we regard ourselves bound to keep this promise and on no account whatever to violate it.

### ADMISSION TO SPECIAL COURSES.

In exceptional cases, undergraduate students, not members of any one of the four regular classes nor candidates for a degree, are admitted to the privileges of the College, and allowed to take special courses, selected under the direction of the Faculty, in such a manner as to secure full and profitable employment of their time. Such special students undergo a preliminary examination sufficient to ascertain their preparation for the course proposed, and are subject to the same regulations and discipline and to the same examinations in the studies pursued,

as other undergraduates. On completing their course they receive certificates of proficiency. These special courses, however, are not offered to those who have failed in the regular course.

## UNDERGRADUATE COURSE OF STUDY.

The course for the degree of Bachelor of Arts extends through four academic years and embraces instruction in the three departments of Philosophy, Language and Literature, Mathematics and Natural Science.

It includes two classes of studies, the required and the elective. The required studies are regarded as fundamental and essential in a liberal education and therefore are not left to the student's option. The elective studies, though important, are not all indispensable and accordingly are left, within definite limits, to the student's choice. Attendance upon all electives, when once chosen, as well as upon all required studies, is obligatory. In connection with some departments there are also optional courses, with voluntary attendance.\*

All the studies of Freshman and Sophomore years are required, and include History, Greek, Latin, Modern Languages, Rhetoric and English Language, Mathematics and Natural History.

From the opening of Junior year onward the student, by availing himself of the elective system, may to a certain extent shape his course with reference to his individual tastes and the profession which he has in view. About two-thirds of the schedule time of the Junior year is given to the required studies, which are Psychology and Logic, English Literature, Physics and Oratory. In addition to this, students are required to pursue three elective studies, to be selected from the following: Philosophy of History, Greek, Latin, German, Anglo-Saxon, Mathematics, Physical Geography.

In Senior year the range of electives is wider, required studies occupying less than two-thirds of the time. The required

studies are Science and Religion, Ethics, Jurisprudence and Political Economy, Astronomy, Chemistry, Geology, English (Essays) and Oratory. The Senior electives are offered in three groups to assist the choice of students who desire to concentrate their elective work in the Department of Philosophy, or of Literature, or of Science, but no student is required to restrict his choice to any group. The Seniors take either six or seven hours a week elective work, making their election from the following list: *In Philosophy*—History of Philosophy, Metaphysics, Science and Religion, Comparative Politics, International and Constitutional Law, Physiological Psychology, Pedagogics, Archæology, History of Art; *In Literature*—English Literature, Greek, Latin, French, German, Sanskrit; *In Science*—Mathematics, Practical Astronomy, Physics, Applied Chemistry, Laboratory Chemistry, Biology or Palæontology, Histology.

Students are required to choose their electives for the first term at the beginning of that term, and no changes will be allowed after the close of the third week, and none before that time, except for special reasons approved by the Faculty.

Students are required to hand in writing to the Registrar, on or before the first Monday in December, their choice of electives for the ensuing second and third terms, and no changes will be allowed after that date, except for special reasons approved by the Faculty.

If a student be in the Sixth Group in any department he shall have liberty to choose his electives only in departments in which his previous standing has been above the Sixth Group. If he desires any other electives he shall send in his proposed list of such electives to the Faculty for approval, and if his choice be not approved, the Faculty shall assign him his electives.

Optional courses, so ordered as not to conflict with the time allotted to the regular instruction of the course, are offered in connection with several departments, under such restrictions as may be prescribed by the Faculty. These courses are designed to benefit those who wish to extend their reading or study in certain branches; they amplify the subjects taken up in the regular course, and in some cases conclude with a special

examination upon which is based a certificate of proficiency. A student may take not more than two optional courses at one time; and only one course, if that course occupies more than two hours weekly. A list of the optional courses is printed on p. 19.

The Freshman class recites in divisions constituted according to rank in order to proportion the work to individual ability; rapid progress can thus be made by those who have special aptitudes for certain studies.

In awarding the Bachelor's degree and assigning the final rank, the student's work for the whole four years is taken into account.

The following is a statement of the various courses of instruction in the three academic departments :

## DEPARTMENT OF PHILOSOPHY.

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Mrs. Robert L. Stuart, of New York, has given to the College one hundred and fifty-four thousand dollars, to maintain professorships in this department, embracing Ethics, Logic, Metaphysics, History of Philosophy and Psychology. She gives this in memory of her late husband, Mr. Robert L. Stuart, and of his brother, the late Mr. Alexander Stuart.

The professorships now established on this foundation are those of Psychology and History of Philosophy, Ethics, and Mental Science and Logic.

Besides the undergraduate courses given below the Department also embraces the courses on Contemporary Philosophy, Plato, and other subjects mentioned in connection with the graduate courses.

### Metaphysics.

#### THE PRESIDENT.

This is a two hour elective in the first term of the Senior year. Of each hour ten minutes are given to dictation and the

rest of the time to an explanatory lecture. Metaphysics is defined as the science of first or fundamental truths. The tests of such truth are self-evidence, necessity and catholicity. They are presented under three aspects: perceptions, regulative principles and generalized maxims. They are divided into intellectual and moral and are subdivided into primitive cognitions, primitive beliefs and primitive judgments. Throughout there are historical and critical notices of opinion. The relation of Metaphysics to Theology and the other sciences is fully discussed. Realism is defended as opposed to Idealism and Agnosticism.

### **Psychology.**

PROFESSOR ORMOND.

Psychology is a required study occupying two hours a week during the first half of Junior year. The subject is treated in two main divisions entitled the Cognitive and Motive Powers. For the first part, McCosh's Cognitive Powers is used as a text-book, accompanied by lectures and recitations. For the second part, McCosh's Motive Powers is used as a text-book, accompanied by lectures and recitations.

### **Physiological Psychology.**

PROFESSORS OSBORN AND SCOTT.

This is an elective course for the Seniors, consisting of twenty lectures and demonstrations, occupying two hours a week during the first term. It is designed to give a general knowledge of the anatomy and physiology of the nervous system especially in their relation to current German, French and English researches upon the localization of functions in the brain.

Professor Osborn opens the course with alternate lectures and demonstrations upon the general structure of the nervous system, including nerves and nerve cells, the sense organs, the brain and the principal motor and sensory nerve tracts in the brain and spinal cord. The demonstrations accompany a laboratory course of practical study and dissection of the brain and

examination of microscopic preparations.. Professor Scott continues the subject with lectures upon the physiology of the nervous system, including the general problems of the origin and transmission of nervous force and the functions of the peripheral nerves, spinal cord and brain. The different theories of the localization of functions in the cerebral cortex are discussed. Experiments illustrating nerve action of different kinds accompany this portion of the course.

### **History of Philosophy.**

PROFESSOR ORMOND.

This is an elective in the second and third terms of Senior year, occupying two hours a week. The topics discussed are : I. The ancient Greek and Roman philosophies, including the Pre-Socratic schools ; Socrates, Plato and Aristotle ; and the Academic, Peripatetic, Epicurean and Stoic sects. Zeller's Greek Philosophy is used as a text-book. II. Modern philosophy from Bacon to the present time, embracing Bacon, Descartes, Spinoza, Locke, Leibnitz, Berkeley, Hume, Reid, Kant, Hamilton and others. Modern philosophy is taught exclusively by lecture accompanied by recitations and discussions.

### **Science and Religion.**

PROFESSOR SHIELDS.

The study of the Harmony of Science and Religion extends through the second and third terms of the Senior year, and includes both a required and an elective course. The required course embraces (1) the harmony of the physical sciences with natural theology ; the Divine Being and attributes as illustrated by astronomy, geology and anthropology ; (2) the harmony of the mental sciences with natural religion ; the doctrine of a future life, divine government and probation as reconcilable with physical, ethical and metaphysical theories ; (3) the harmony of science with revealed religion ; the miraculous, prophetic, historical, and philosophical evidences of Christianity, and its

consistency with the whole system of the physical and psychical sciences.

The elective course embraces the study of the sciences as connected with revealed religion; their history, classification and methods; normal and existing relations of reason and revelation; emerging religious controversies in the different sciences, the problem of their adjustment, and the issuing philosophical system.

While the required course aims to present the essential Christian evidences as usually taught in colleges, the elective course may also have the incidental effect of promoting that sound ultimate philosophy which results from the harmony of science and revelation and looks forward to the gradual purification and completion of human knowledge.

In the elective course the instruction is given entirely by lectures. In the required course Butler's Analogy is used as a text-book, with occasional lectures, and monthly reviews and extemporaneous essays take the place of a final examination.

### Logic.

PROFESSOR ORMOND.

Logic is required in the last half of Junior year. (1) Deductive Logic—comprising the laws of discursive thought as implied in notions, judgments and reasonings. The syllogism and other forms of reasoning will be discussed. Text-book, McCosh's Manual of Logic. Text-book instruction will be accompanied by lectures and practical exercises. (2) Inductive Logic—treating of the principles and laws of induction, the canons of investigation and kindred topics. It is taught by lectures and practical exercises with references for collateral reading.

### Ethics.

PROFESSOR PATTON.

This is one of the required studies of the Senior year. Two hours a week are devoted to it during the first term and one



hour during the second term. Instruction is given by lectures accompanied by the use of Calderwood's Handbook of Moral Philosophy as a text-book. The lectures deal with both Theoretical and Practical Ethics and embrace such topics as the foundation of moral obligation, the will, conscience, the nature of virtue, and the moral law. Special attention is given to recent ethical discussions, and portions of representative ethical treatises are recommended for collateral reading.

### **Philosophy of History and Political Science.**

PROFESSOR SLOANE.

I. *Sophomore Class.* Two exercises a week throughout the first term, required. Outlines of Universal History. Freeman's General Sketch of History is used as a text-book. Lectures, narratives and discussions are introduced as occasion requires.

II. *Junior Class.* Two exercises a week throughout the year, elective. Lectures and recitations on transitional epochs of history, with special reference to the science of politics and the progress of civilization.

III. *Senior Class.* Two exercises a week throughout the first term, elective. Lectures and recitations on (1) The rise and growth of European Colonies in North America and the causes of the War of Independence; (2) Comparative Politics from the standpoint of American institutions.

IV. *Graduate Course.* One exercise a week throughout the first and second terms. Historical methods and historical systems.

### **Jurisprudence and Political Economy.**

PROFESSOR JOHNSTON.

I. **REQUIRED COURSE.** The Senior class has for two hours a week throughout the first and second terms a course in the Philosophy of Public Law in its connection with the material interests of the State; and in Political Economy, covering the historical development of the science, in all its phases and schools.

Instruction in both branches of the course is by lecture, but some chapters of Pollock's History of the Science of Politics are used as a text-book in Jurisprudence, and Walker's Political Economy will be used as a text-book in that branch.

II. ELECTIVE COURSE. The Senior class has for two hours a week throughout the second and third terms a course in International and Constitutional Law, covering the three following subdivisions: (1) International Law, from the Peace of Westphalia to the Treaty of Berlin; text-book, Gallaudet's Manual of International Law; (2) the Constitutional Law of the United States, by lecture, including also the provisions of the State systems, so far as they are necessary to explain the Federal system; (3) the Political History of the United States since 1787; text-book, Johnston's History of American Politics.

III. GRADUATE COURSE IN COMMON LAW. A course in the elements of the English Common Law is open to graduates in the second and third terms. The first and third books of Blackstone's Commentaries are used as a text-book.

IV. OPTIONAL COURSES. (1) ROMAN LAW. An optional course of lectures on Roman Law, with Morey's Outlines of Roman Law as a text-book, is given to the Senior class during the first term; and Professor Packard continues and completes it by reading the Institutes of Justinian with the class during the second term. (2) ADVANCED POLITICAL HISTORY. During the third term an optional class of Seniors will read a volume of Von Holst's Constitutional History of the United States, with Professor Johnston.

### **Pedagogics.**

#### **PROFESSOR WEST.**

This is an elective course in the Senior year, and occupies two hours weekly in the second and third terms. It consists of lectures supplemented by text-book instruction, and develops the subject in its historical, theoretical and practical relations. A thesis is required at the end of the course.

## SCHOOL OF ART.

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PROFESSORS PRIME, MARQUAND AND FROTHINGHAM.

This department aims to establish a museum and to furnish instruction in the History of Art and Archæology.

Since the publication of the last catalogue the Museum has acquired a collection of nearly two hundred vases illustrating the history of the ceramic art in one part of Etruria from the earliest hand-made ware of the sixth century, B. C., to the degraded Greek manufactures of the third century; a series of mediæval works of art illustrating the technique and materials employed for artistic purposes, among which may be noted two German wood carvings of the fifteenth and sixteenth centuries; a carved bone and ebony casket of the fourteenth, and a manuscript of the early fifteenth century with thirteen full-paged miniatures of the Italian school, a marble bas-relief of North German art of the early fifteenth century, German blocks of the sixteenth century for printing and stamping, and a large collection of photographs of French architecture during the Mediæval and Renaissance periods and of Italian architecture and sculpture. A new instrument for projecting drawings and opaque objects in their natural colors has been completed in London and will be ready for use next term. A prize in architecture has been established by Mrs. Norman White, in memory of her son Frederick Barnard White of the class of 1883. The prize is open to Seniors at the end of the college year. Ground has been broken for the foundations of the Museum of Historic Art and the central building will be finished by next Summer.

### I. Public Lectures :

(1) President McCosh gives a few lectures on *Æsthetics*, especially on the Beautiful, the Picturesque and the Sublime.

(2) Professor Prime will probably give a short course of lectures on the History of Various Arts.

(3) A short course on ancient painting and painting of the Early Renaissance in Europe will be given by Professors Marquand and Frothingham.

**II. Graduate Courses :**

(1) Prof. Frothingham lectures once a week during the first term on Oriental archæology.

(2) Prof. Marquand will conduct a private class in the art of the Renaissance.

**III. Senior Electives :**

(1) Prof. Frothingham, on the history of Christian architecture ; two exercises a week during the first term.

(2) Prof. Marquand, on the history of Greek art ; two exercises a week during the second and third terms.

**IV. Junior Optional :**

(1) Prof. Marquand lectures on Greek mythology in art, once a week during the first term.

(2) Prof. Frothingham lectures on Italian painting, once a week during the second term.

## **DEPARTMENT OF LANGUAGE AND LITERATURE.**

### **Greek.**

PROFESSORS CAMERON, ORRIS, AND WINANS.

#### *Freshman Year.*

The Freshman class is divided into four sections, each of which receives five hours of instruction in Greek every week during the first term, and four hours a week during the second and third.

**POETRY.**—Homer : The Iliad, Books XVI., XVIII., XXII. ; Epic forms and syntax ; prosody and scanning ; the Homeric question ; antiquities and mythology. Two exercises a week during the first and second terms, and one during the third, by Professor Cameron.

**PROSE.**—The Greek Historians: varied selections from Herodotus, Thucydides, and Xenophon, made with an aim to illustrate the best style of the author, and likewise, as far as practicable, to present thus from the original sources the history of

the most interesting and important epochs,—the rise of the Persian monarchy, the Persian wars, Athens under Pericles, opening and closing scenes in the Peloponnesian war, the downfall of Athens. This is followed by a short course of outlines of Greek history, in English, intended to review and supplement the previous course and to furnish a comprehensive view of the whole subject. The class is trained in reading at sight, and with the advanced sections a considerable amount of Herodotus is thus read.

Xenophon's Symposium is read in the third term, with sight reading of sections from the *Oeconomicus*; accompanied also by talks on Greek domestic life.

Also, throughout the year, review of Greek grammar, with elucidations; review of elementary Greek prose composition with written exercises, followed by advanced Greek prose (Sidgwick's). Three exercises a week, in first term, two in second term and three in third term, by Professor Winans.

NOTE.—As the authors and the amount read during the Freshman year may vary from year to year, the following is indicated as a *minimum* for applicants for Sophomore standing: Homer, books XVI., XVIII., XXII.; Greek historians, 100 pages, selected at pleasure, one-half to be from Herodotus or Thucydides.

#### *Sophomore Year.*

The Sophomore class is divided into two sections, each of which receives four hours of instruction in Greek every week during the first and second terms; three hours during the third.

GREEK ORATORY.—The Olynthiacs and Philippics of Demosthenes; Demosthenes and the political condition of Greece in his time. The Rhetoric of Aristotle, Book III., with analysis and comments; Greek prose composition on the basis of the text of Demosthenes, including analyses in Greek of the Olynthiacs and Philippics; dictations on Greek lexicology, stating and explaining the laws pertaining to the formation, derivation and definition of the words of the language. The first half of the class recites in two subdivisions, each subdivision four hours a week during the first term; the second half in two subdivisions, each four hours a week during the second term and three hours a week during third term, to Professor Orris.

**POETRY.**—Euripides: the *Medea*. The origin of tragedy; analysis of the *Medea*; life of Euripides. The second half of the class recites two hours a week during the first term, the first half two hours a week during the second term and three hours a week during the third term to Professor Cameron.

**PROSE.**—Xenophon: the *Memorabilia*. A selection is made of the more interesting parts of the memoirs, especially of such as are important to subsequent philosophical study. While these parts are read carefully, it is found practicable to read at sight most of what is left. Such general subjects are treated as the life of Xenophon; review of his works; his relations to Socrates as pupil and biographer; review of the political history of the period; the Socratic system of ethics; the method and influence of Socrates as a teacher. Selections from Lucian; society, religion and literature of the second century, A. D. The second half of the class recites two hours a week during the first term, and the first half two hours a week during the second term to Professor Winans.

### *Junior Year.*

**ELECTIVE GREEK.**—Attic tragedy: Æschylus—selected dramas. Lectures on the works of Æschylus, and on the origin, character and relations to modern literature of the Attic drama. Two hours a week for half the year. Professor Orris.

Aristophanes. Ordinarily one play is read critically, another more rapidly. The following are some of the collateral subjects treated by lecture, with references to various text-books: the Dionysus myth and worship; the development and history of comedy; a review of Aristophanes' extant works and the fragments; Aristophanes' literary criticisms, and his attitude toward the philosophical, social and political movements of his time; the presentation of comedies; the metres of comedy. Thucydides, Plutarch, Lucian, may be introduced either as a special course, or to furnish material for sight-reading. Two hours a week for half the year. Professor Winans.

**OPTIONAL.**—Lyric poetry, or advanced Greek prose composition. Professor Orris.

*Senior Year.*

**ELECTIVE GREEK.**—Tragedy : Sophocles. The *Œdipus Tyrannus*. Criticism of the play, the plot, the significance of the tragedy. Description of the Greek theatre. Lectures on the physical geography of Greece as affecting the character and language of the people ; the origin of the Greek alphabet ; the characteristics of the Greek language ; rise and character of Greek literature ; epic poetry ; lyric poetry ; history ; tragedy ; comedy ; oratory ; philosophy ; Greek antiquities ; manners and customs ; remains of cities and buildings. Two hours a week second and third terms. Professor Cameron.

**GREEK PHILOSOPHY.**—Plato ; selected dialogues. Lectures on the philosophy of Plato ; on Greek literature and philology ; on the theories of the origin of language, and on the causes which underlie and determine dialectic varieties. Two hours a week first term. Professor Orris.

**OPTIONAL.**—Theocritus, with a review of his relations to subsequent poetry. Professor Orris.

**SCHOOL AT ATHENS.**

This College, in connection with others, assisted in establishing and contributes to the support of the American School of Classical Studies at Athens. This school affords facilities for archæological and classical investigation and study in Greece, and approved graduates of this College are entitled to all its advantages free of tuition. Professor Sloane represents Princeton in its Managing Committee.

**Latin.**

**PROFESSORS PACKARD AND WEST AND MR. RODDY.**

Instruction given in the Department of Latin Language and Literature and Science of Language involves,

*First*—The constant training of classes in the etymology and syntax of the language, and in the power to translate it accurately and fluently into idiomatic English.

*Second*—Instruction in Latin prose composition. The object here aimed at is not facility in writing Latin as an accomplishment, but rather the acquisition of power to translate at sight any ordinary Latin into fluent literary English and to think easily in the Latin order of thought.

In the Freshman year written exercises form the basis of instruction. These exercises are examined in order to leave no errors uncorrected. Practice in extemporaneous composition, both oral and written, is continually attempted on as extensive a scale as the student's grammatical knowledge permits. Thematic composition, in its higher forms, is reserved for later optional study.

*Third*—The reading and interpretation of particular authors, whether literary or historical, or both combined. This implies, as collateral branches of study, the history of Roman literature and the archæology of Roman life, social and political. Roman history is studied in its three leading periods; first, in connection with portions of Livy's Histories, the early history down to the times of the Gracchi; second, in connection with Cicero's Letters, the period from the Gracchi to the Empire; and, third, in connection with Juvenal's Satires and Pliny's Letters, the earlier Empire, especially its moral and religious aspects in contrast with Christian truth and Christian life.

The exercises with the two lower classes are chiefly recitations, accompanied, or rather interspersed with constant communication of collateral illustrative instruction suggested by the text-book, calculated to quicken and broaden the interest of the student; with care, however, not to infringe upon the frequency and thoroughness of the recitations required of the student. Occasional lectures of a more formal character are introduced in the Sophomore year. These treat, in connection with Cicero's Letters, of the representative characters and historical scenes and topics there found; and in connection with Horace, the history of literature down to his time, his contemporaries, the introduction and influence of Greek, especially Alexandrian, literature at Rome, and his own characteristics as to topics, style, views of life, etc.



In reading Terence and Plautus, translation is desired as close to literary English as the comic style and sentiment will allow; and to this end the class is required to read large portions in review and at first sight in advance work. Practice is given in reading the comic metres in order to show their dramatic and linguistic value, especially as bearing upon the colloquial use of Latin. Among other topics investigated are the principles of language-change embodied in the metres, the literary obligations of Terence to Plautus, and of both to early Latin literature and the Greek comedians, the social life of Rome in the second century B. C., and the relations of ancient to modern comedy.

In the Junior year lectures are more frequent; in connection with Juvenal and Pliny, treating of the other sources of our more intimate knowledge of the social and moral condition of the Empire in Italy and the provinces; and, in connection with such of Cicero's rhetorical, ethical, or religious treatises as are read, treating of literary life and training at Rome, the sources and character of Roman philosophy and the religion of Rome. In the Senior year lectures occupy about one-third of the time, being in part illustrative of Lucretius, but chiefly upon the science of language, its general principles, physiology of speech, phonetic laws, formation of words, history of inflections, comparative laws of syntax.

The authors used in the order of the curriculum are Livy; Horace's Odes; Selected Letters of Cicero; Terence; Tacitus; Horace's Satires and Epistles; Catullus; Juvenal's Satires; Selected Letters of Pliny; Suetonius; Plautus; Cicero's Treatises (De Oratore, De Natura Deorum, De Fato, etc., varying from year to year); Lucretius, De Rerum Natura; Bruns, Fontes Juris Romanæ, with use of Corpus Inscriptionum Latinarum, and Ritschl, Priscæ Latinitatis Monumenta; Justiniani Institutiones; Selections from Seneca's Moral Epistles; also from Tertullian and St. Augustine.

The instructors suggest questions for special investigation, and designate volumes and parts of volumes, illustrative of the author or period under study, to be read in private by the class

during the term, upon which questions are put in examination papers eliciting extended written answers.

On two evenings of each week such students as wish, meet with Professor Packard for the study of some Latin work collateral with the class-room exercises. The sources of Roman law constitutes the graduate course for the present year.

### **English Literature.**

**PROFESSOR MURRAY.**

The study of English Literature is pursued during the Junior year, and through the first term of the Senior. It includes both a required and an elective course.

#### *Junior Year.*

The required course extends through the year, occupying two hours a week. In the first term special attention is given to the study of Chaucer, in order to gain some knowledge of the English language at that stage of its development; mainly, however, for the sake of his poetry. In addition to lectures, some of Chaucer's poems are read in the class-room. After Chaucer, Spenser and the English drama before Shakespeare are the subjects of study.

In the second and third terms lectures are given on Elizabethan dramatists and on Bacon, Milton, and Dryden. Milton's *Paradise Lost* is studied at some length. The chief writers of the Queen Anne Period are also discussed. The required course ends with the study of the Literary Restoration. Cowper, Burns, Wordsworth, Byron, Shelley and Sir Walter Scott are the principal authors brought under review. Should time permit, some representative authors of the Victorian Period will also be noticed.

During the third term a play of Shakespeare is studied in the class-room, with reference to a further study of Shakespeare in the Senior year.

#### *Senior Year.*

The elective course, to which two hours a week through the first term are assigned, is mainly devoted to critical study of

Shakespeare's plays. The choice of these varies from year to year. Those to be read during the first term are Hamlet, Othello, Macbeth and one of the historical plays.

In addition to this study of Shakespeare, lectures on folklore may be given in this course.

An optional class is formed during the second term, for reading authors not treated in the class-room. Essays also are required from both the Junior and Senior classes.

### English Language and Discourse.

PROFESSOR HUNT.

#### *Freshman Year.*

The elements of Discourse are studied as embraced in the following subjects: theme, choice of material, diction and structure. The study of English words, as given in Trench (Study of Words) is also pursued. Essay writing is an essential part of the course, and is continued through the year. Lectures on English Vocabulary.

#### *Sophomore Year.*

The study of Discourse—its principles, processes, qualities and forms—is pursued. Also, the historical study of the English language. Essays are required throughout the year.

#### *Junior Year.*

The study of Anglo-Saxon as an elective branch is begun. On the basis of March's and Sweet's text-books, the student is drilled in the forms and principles of grammar and taught to read with ease the best prose and poetry of First English. In connection with this grammatical and textual study, instruction is given by lecture on a large variety of subjects—philological and historical—rightfully included in such a course. The students are also encouraged to private reading on any of the topics presented in the class-room. Beowulf and Caedmon are read as an advanced course.

**Oratory and Æsthetic Criticism.****PROFESSOR RAYMOND AND MR. MILLER.***Freshman Year.*

First term, weekly lectures and drill in elocution, explaining the meanings and teaching the methods of gesture and vocal emphasis, with readings and declamations required from all the class. Text-book, Raymond's Orator's Manual.

*Sophomore Year.*

Exercises according to degrees of proficiency. Two private rehearsals of declamations and one written oration required from all, supplemented by a voluntary course in vocal culture.

*Junior and Senior Years.*

Oratorical delivery and composition, and the analysis and illustration of themes. In Junior year one written oration and two rehearsals in delivery are required from all; in Senior year two written orations, two rehearsals, and public speaking before the College, in which there are contests for various prizes in oratory, poetry, and disputation. (See heading "Prizes and competitive Scholarships.") Besides this, between fifteen and twenty of the best writers and speakers among the highest honormen deliver orations at Commencement. There is an endeavor to adapt the course, as continued through these two years, to the individual needs of students; and opportunities are afforded for voluntary work, together with training, thorough and complete, in vocal culture, and instruction in the principles of æsthetic criticism, as applied to elocution and rhetoric and to poetry and the other arts.

**Exercises in English Composition.**

These are prepared under the supervision of the professors of English literature, rhetoric and oratory, and are carefully examined and corrected. The requirements are: Freshman year, five or six essays; Sophomore year, five or six essays and one oration; Junior year, five essays and one oration; Senior

year, two essays and two orations. In every year of the course several prizes or honorary appointments are given for excellence in essay writing and in public address, either by the College, or by the Cliosophic or American Whig Societies, acting through committees appointed from their own members in the Faculty. (See heading "Fellowships, Prizes, Scholarships.")

### Modern Languages.

PROFESSOR KARGÉ AND DR. WESTCOTT.

This course comprises the study of the French and German languages. The former begins as a required study in second term Freshman year and continues through the Sophomore year, twice weekly. Recitations are conducted in divisions averaging twenty-five students each. For a better apprehension of the thought as well as for greater facility in the use of the language, oral and written recitations alternate. Essential rules pertaining to grammar-forms, pronunciation, paradigms of regular and of irregular verbs, translation from English into French, reading and analysis, constitute the course of instruction in the Freshman year.

#### *Sophomore Year.*

Review of the course of the preceding year, with a more comprehensive treatment of the verb as regards the use of tenses, moods and participles; this in addition to a study of the essential principles which characterise the origin and development of the language, constitutes the first term's instruction. Half of the second term is spent in reading George Sand's *La Mare au Diable*, in which idiomatic expressions and delicate shades of modern French construction are carefully noted. For a better comprehension and appreciation of the study of French literature, the remainder of the year is taken up with reading Lacombe's *Petite Histoire du Peuple Français*. As introductory to the classical writers, selections from Corneille's *Cid*, Racine's *Athalie* and Molière's *Le Bourgeois Gentilhomme* are critically read and interpreted. At the close of the Sophomore year, students are required to pass a final oral and written examination

in descriptive grammar and in the history of the language; moreover, to render at sight into fluent English any given author whether in prose or poetry.

*Junior Year.*

Such students as have acquired during the preceding two years sufficient knowledge can, if so inclined, pursue an independent course of study in French, while an opportunity is offered them to take up German twice weekly as an elective for the remainder of their college course. As the difficulties in pronouncing German are in no way to be compared with those met with by the student in French, reading, grammar-forms and translation into English are simultaneously taken up, and when a fair knowledge of the verb and its construction is attained, easy and interesting German prose is read, whereby the students are encouraged to form and answer questions in the vernacular. Towards the middle of the second term, Goethe's *Hermann und Dorothea* is taken up, the German itself being used, as far as time permits, in conducting the recitations.

*Senior Year.*

Besides the reading of Lessing's *Nathan der Weise*, Minna von Barnhelm and Schiller's *Jungfrau von Orleans*, a portion of each hour is devoted to lecture, in which the literary history of leading European nations, from the Italian Renaissance to the Unification of Germany, is expounded.

Provision will shortly be made for instruction in the Italian and Spanish languages.

**Sanskrit.**

PROFESSOR WINANS.

Sanskrit is a two hour elective in Senior year. Students are requested to advise with the professor before electing it. In the grammatical study special attention is paid to the bearing of the language on philology and comparative grammar. The various phenomena of the language, its sounds, roots, forms, inflections, are considered with some detail in relation to those

of other Aryan tongues. The following is an outline of the early stages of the course ; Sanskrit Primer (Perry), a series of graded lessons on the plan of Greek and Latin first-lessons ; reading of several books of the Nalopâkhânam, an episode in the great Hindoo epic, the Mahâbhârata, with review of Sanskrit grammar (Whitney's); then, selections from the Hitôpadeça.

## DEPARTMENT OF MATHEMATICS AND NATURAL SCIENCE.

### Mathematics.

PROFESSORS DUFFIELD AND FINE AND MR. REED.

In the Freshman year there are two exercises a week during the first and second terms, in algebra, and two exercises a week during the third term, in plane trigonometry, under Professor Fine ; in geometry there are two exercises a week throughout the year, under Mr. Reed. The text-book in algebra is Wells' University Algebra, to be supplemented by a course on the theory of equations, by the professor. Loomis' Trigonometry is the text-book in trigonometry. Euclid is used as the text-book in geometry because of its historical associations and its decided superiority for the purpose of mental discipline to any modern text-book. The first six and the eleventh books of Euclid are supplemented by a course in solid and spherical geometry. Since a thorough knowledge of geometry and familiarity with its more important propositions can be obtained only by extended practice in the demonstration of theorems and problems not contained in the text-book, this exercise occupies a prominent place in the course of instruction.

The Sophomore class has three exercises a week throughout the year in mathematics, under Professor Duffield. For the first term the studies are analytical trigonometry, mensuration and navigation ; for the second and third terms; surveying, spherical trigonometry, analytical geometry and the elements of the differential calculus.

In the Junior year mathematics is an elective study. The class has two exercises a week throughout the year, under Professor Duffield. For the first and second terms the studies are analytical geometry and the differential calculus; for the third term, the integral calculus. Loomis' trigonometry is the text-book during the first and second terms of the Sophomore year, Bowser's Analytical Geometry and Calculus during the third term Sophomore and the Junior year—supplemented largely by oral instruction, and numerous exercises in addition to the examples for practice of the text-books.

The Senior class in mathematics (elective) has two exercises a week throughout the year, under Professor Fine. The course for the current year is analytical geometry of three dimensions, differential and integral calculus. Williamson's text-books on the calculus are used, supplemented by lectures on determinants, differentiation and integration of functions of the complex variable, definite integrals.

A characteristic feature of our method of teaching mathematics is the prominence given to oral instruction. Throughout the course, lectures on the history as well as on the principles of the different branches of study are given by the instructors.

### **Astronomy.**

PROFESSORS YOUNG AND MCNEILL.

#### *General Course—Required.*

The course occupies three hours weekly during the first half of the year. There are two examinations, one just before the Thanksgiving recess, and one at the close of the course.

In the first half of the course the principal subjects treated are astronomical instruments, the methods of finding time, latitude and longitude, the earth in its astronomical relations, and the moon. In the second part, the sun, the planetary system and the stars are discussed.

The aim of the course is to impart a knowledge of the most important facts of the science, with an understanding of its principles, but the higher mathematics of the subject are not



attempted. The class have frequent opportunities for examining the most interesting objects with the telescope.

*Practical Astronomy—Elective.*

One exercise weekly during Senior year. Text-book, Loomis' Practical Astronomy. The exercises consist of lectures upon the various instruments and their uses, with recitations from the text-book, and the discussion of the observations made by the class.

When the weather permits, each member of the class is required to spend from two to six hours weekly in making and reducing observations. The principal subjects embraced in the course are the following :

I. SEXTANT AND REFLECTING CIRCLE.

- (a) Adjustment and errors.
- (b) Determination of local time by altitudes of the sun (or stars).
- (c) Latitude by circum-meridian altitudes of the sun.
- (d) Latitude by altitude of the pole star and a corresponding southern star.
- (e) *Determination of the eccentricity and graduation errors of the instrument.*

II. TRANSIT INSTRUMENT.

- (a) Theory of errors and adjustment.
- (b) Determination of local time by star observations, the azimuth correction being determined by a pair of circumpolars.
- (c) *Reduction of a complete set of time observations by the method of least squares.*

III. THE ZENITH TELESCOPE.

- (a) Determination of latitude from star observations, the instrumental constants being independently determined.
- (b) *Determination of latitude, together with the instrumental constants, by observations reduced by the method of least squares.*

IV. PRIME VERTICAL INSTRUMENT.

Determination of latitude and instrumental constants by star observations.

## V. ASTRONOMICAL THEODOLITE.

- (a) Azimuth by observations of the pole star.
- (b) *Latitude and time by Gauss' "three star method."*

## VI. MERIDIAN CIRCLE.

- (a) Determination of instrumental constants.
- (b) Determination of star places (right ascension and declination), including the reduction of apparent place to mean.
- (c) *Investigation of errors of graduation and periodic errors of micrometer screw.*

## VII. EQUATORIAL.

- (a) Adjustment of the instrument.
- (b) Determination of the place of a comet or minor planet by the ring or square micrometer.
- (c) Study of the spectra of sun spots and solar prominences.
- (d) *Measurement of double stars with the wire micrometer.*

## VIII. MISCELLANEOUS.

- (a) Value of level divisions determined with the "level-trier."
- (b) Determination of personal equation with Eastman's personal equation machine.
- (c) *Form and size of transit instrument pivots determined with pivot spherometer.*

NOTE.—The italics denote problems regarded as supplementary. For want of time they are not generally all taken by any one member of the class, but are distributed according to circumstances.

## Physics.

PROFESSORS BRACKETT AND MAGIE.

*Junior Year.*

REQUIRED COURSE.—This course is conducted by means of recitations and lectures. Anthony and Brackett's Elementary Physics is used as a text-book. The subjects treated are:

First term—elementary mechanics; general properties of bodies; hydrodynamics; pneumatics; heat and thermodynamics.

Second term—magnetism; electrostatics; electrodynamics.

Third term—acoustics; optics.

The valuable and well selected apparatus with which the department is supplied is constantly employed to illustrate and enforce the principles discussed.

Four hours a week during the first term and three hours a week during the second and third terms, are allotted to this course.

#### *Senior Year.*

**ELECTIVE COURSES.**—These courses, in general, involve practical work in the Physical Laboratory. They afford opportunity for the extended study of special topics.

The students pursuing the laboratory courses are referred to the special manuals and memoirs accessible in the Library of the College. In addition, recitations upon Cumming's Theory of Electricity are required from all members of the laboratory class.

The following are among the problems ordinarily assigned; determinations of the intensity of the force of gravity at Princeton, by the method of Kater and by that of Borda; determination of the modulus of elasticity for different metals; determination of the magnetic declination and of the horizontal component of the earth's magnetism, by means of the magnetometer; determination of the magnetic dip and of the total magnetic force by means of the dip circle; measurement of the electromotive force of various elements in absolute units by means of the absolute electrometer and by means of the quadrant electrometer; measurement of electric currents by means of the voltameter; verification of Faraday's laws of electrolysis; determination of the efficiency of the dynamo-machine; measurement of the work expended in maintaining an incandescent lamp in action, (1) by means of the electric relations of the circuit, (2) by means of the calorimeter; determination of index of refraction by several methods; verification of Fresnel's researches in diffraction, with discussion; measurement of wave lengths of light by simple diffraction methods and by means of the spectrometer; examination of the phenomena and laws connected with polar-

ized light; determination of specific heats by various calorimetric methods; investigation of radiant heat by means of Meloni's apparatus.

Those electing these courses are expected to devote at least two hours a week to laboratory work. At the close of the year each student is required to present a thesis discussing some problem previously assigned.

A course in theoretical physics is also offered, to consist of the reading and discussion of a treatise on some special department of physics, with experimental demonstrations.

### **Chemistry.**

PROFESSOR SCHANCK.

Students in the Academic Department attend a required course in general chemistry throughout the entire Senior year, and an elective course in applied chemistry during the second and third terms.

The course of instruction in general chemistry occupies two hours in the class-room each week, and in this course the attempt is made to give quite fully the leading principles and facts of general chemistry, enforced by carefully prepared experimental illustrations. Besides these table illustrations, free use is made of lantern projections. The advantage of taking notes and of reading, in connection with the lectures, such works as Roscoe's, Remsen's, Richter's, Wurtz's, Miller's and Roscoe and Schorlemmer's, is appreciated and urged upon the class.

The additional parallel and elective course, embracing the leading applications of chemistry in the arts of life, also illustrated fully, occupies one hour each week second and third terms.

### **Laboratory Chemistry.**

PROFESSOR CORNWALL AND DR. MCCAY.

This branch of chemistry constitutes an elective study during the first term of the Senior year. The course includes lectures by Professor Cornwall, with occasional recitations, and

also work in the Laboratory under Dr. McCay. Qualitative chemical analysis is first taken up, the students learning to detect single bases and acids, acquiring thereby sufficient training to pursue further the study of qualitative analysis without supervision, should they desire to do so. At the same time they are required to explain fully, by chemical formulas and written explanations, all of the reactions involved in making the tests.

During the latter part of the term, experiments illustrating principles of general chemistry and chemical physics are first performed by the students, after which the most important classes of organic compounds are studied, and finally a few special examinations are made, such as: analysis of potable waters; examinations of milk; study of the general properties of the alkaloids, with a few characteristic tests; properties of disinfectants. The object of the course is to train the student, as far as possible, in chemical manipulation, by means of experiments which shall both illustrate chemical principles and furnish practical knowledge likely to be of use in any subsequent professional or scientific study.

The course requires five or six hours a week; three or four hours being generally devoted to laboratory work, and two hours to lectures and recitations.

### **Geology and Palæontology.**

PROFESSORS SCOTT AND OSBORN.

I. GEOLOGY.—The course in geology, conducted by Professor Scott, occupies three hours a week through the last half of the Senior year. The subjects treated are: (1) dynamical geology; (2) structural geology, including lithology and petrography; and (3) historical geology and palæontology. The text-book used is Le Conte's Elements of Geology (revised edition).

II. PALÆONTOLOGY.—The course in palæontology is one of the elective studies of the senior class, and occupies about three hours a week throughout the year, including one lecture and two hours of laboratory work a week. The course of lectures, under Professor Scott, is devoted chiefly to the subject of verte-

brate palæontology and anatomy. Two hours a week are given to the laboratory work under the direction of Professors Osborn and Scott. This is a parallel course of anatomical study, with dissection of the fishes, reptiles, birds and mammals which represent living groups and throw most light upon the structure and development of the fossil vertebrates as described in Professor Scott's lectures. The dissections are accompanied by demonstrations and drawings. Practical work is also carried on in the zoological and geological museums, and includes a series of museum demonstrations with explanations and comments upon the specimens in various collections. At the close of the course, a short original thesis on one of the fossil vertebrates in the E. M. Museum is required of each student, and takes the place of the lectures and practical work of third term. The text-books employed are Huxley's *Anatomy of the Vertebrates*, Parker's *Zoöatomy* and Wiedersheim's *Comparative Anatomy* (Parker).

For advanced students there are especial facilities for study in the large number of undescribed fossil vertebrates collected in the West by the scientific expeditions sent out by the College in 1877, 1878, 1882, 1885 and 1886.

### Physical Geography.

PROFESSOR LIBBEY.

This course occupies two hours each week throughout the second and third terms of Junior year, as an elective study. It consists of the study of the earth in the age of man, comprising two parts :

A. THE GEOGRAPHY OF NATURE, or physical geography proper.

1. The earth in the solar system ; astronomical geography, especially with reference to climatology.

2. The earth as a whole, or physics of the globe ; its form, dimensions, density and weight ; its proper temperature, volcanoes and earthquakes ; its magnetism.

3. The surface of the earth.

a. The lands, their arrangements; morphology of the continents; laws of relief.

b. The waters and their movements; inland waters and continental drainage; oceanography; tides and marine currents:—the facts and their causes.

c. The atmosphere; climatology; laws of distribution of temperature; winds and rains; snow, ice and glaciers.

4. Laws of the distribution of plant and animal life.

B. GEOGRAPHY OF MAN, or the relations of physical geography to the history of mankind; human races, characteristics and law of distribution, contrasted with the distribution of life in nature; the historic races and their functions in history. The continents as instruments for the development of human societies. The continents of nature: Africa, South America, Australia. The continents of history: Asia, Europe, North America. Their special functions in the progressive development of mankind.

Lectures and recitations, with oral and written examinations. Text-books:—Physical Geography, Guyot; Earth and Man, Guyot. Both courses are abundantly illustrated by maps and diagrams; and an optional course of lectures is given in which the lantern is used to illustrate the phenomena treated of in the regular course by means of a series of views from nature, numbering upwards of four thousand.

### **Zoology and Botany.**

PROFESSORS SCHANCK AND MACLOSKIE.

The required studies in these branches are included in a course which occupies one hour a week of the first and second terms, and two hours a week of the third term of the Sophomore year. Professor Schanck opens the course with a series of lectures, illustrated by models and diagrams, upon human anatomy and physiology. Professor Macloskie resumes the work during the second term in a series of lectures on elementary zoology. In the third term Professor Macloskie conducts a series of recitations in botany, accompanied by practical work in the examination of plants. In the Senior year, students may elect either

biology or palæontology. The latter is conducted by Professor Scott, with practical biological work under Professor Osborn. (See course in Geology.)

### **Biology.**

The Senior Elective Course in Biology is conducted by Professor Macloskie and Professor Osborn, and forms a continuation of the Zoology and Botany of the Sophomore year. It is divided as follows:

#### *I. Botany and Invertebrate Anatomy.*

PROFESSOR MACLOSKIE.

This course occupies one required and three optional hours per week during the first term and includes the examination of representative types of phænogamous and cryptogamous plants, and the structure of such invertebrate forms as amœba, planaria, the earth-worm, lobster, locust, fresh-water mussel, and the ascidians. The laboratory work includes the dissection of these forms, and the use of the microscope for the elucidation of their histology.

#### *II. Vertebrate Anatomy and Embryology.*

PROFESSORS OSBORN AND SCOTT AND MR. PHILLIPS.

This elective is a continuation of Professor Macloskie's Course in Biology during the first term of Senior year and occupies two hours a week during the second and third terms. The course is designed as a preparation for the study of medicine and advanced biology, and consists of: 1st, Lectures by Professor Osborn upon general vertebrate anatomy and upon the theory of evolution of living types. 2d, Demonstrations of vertebrate embryology in the alternate hours. 3d, These demonstrations accompany the practical work, conducted by Mr. Phillips. This is exclusively embryological and is given to the study of the development of the chick, following the course of Foster and Balfour's *Elements of Embryology* with instruction in the technique of embryological methods.

The course will be given this year in the Morphological room of the Class of 1877 Biological Laboratory. A fee of \$4.50 is



charged for the use of the laboratory appliances, reagents and a case of instruments, subject to a drawback.

During the second term an optional course of lectures on the embryology of the vertebrates will be given by Professor Scott.

### **Histology.**

#### **PROFESSOR LIBBEY.**

This study is an elective, occupying one afternoon each week during the second and third terms of Senior year, and consists of lectures and recitations upon normal histology. Only the normal tissues are discussed, and as wide a range of comparative study of the tissues in the animal kingdom is made as the time allotted permits. Especial attention is devoted to injecting, hardening, preserving, staining and mounting specimens, and students are carefully drilled in section cutting and in the use of the microscope, every facility being placed in their hands to enable them to do good work.

The lecture occurs on Wednesday afternoon of each week at 3 o'clock, but the laboratory is open at all hours to its regular students for private investigation, and the Instructor or the Biological Fellow will be present every afternoon to give assistance to those who may be present. A fee of \$10 is charged to cover mounting material, slides, etc.

Text-books recommended:—Klein, Prudden, Shakespeare-Allen, Stirling, Striker.

### **SYNOPSIS OF COURSE.**

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#### **FRESHMAN YEAR.**

##### *First Term.*

**LATIN**—Livy, (Book I). Roman History (Leighton's History of Rome). Latin Prose Composition. **GREEK**—Homer's Iliad, (Book XVI). Selections from Herodotus, Thucydides, Xenophon. Greek Grammar. Greek Prose Composition. **MATHE-**

**MATICS**—Algebra (Wells'). Geometry (Todhunter's Euclid). **ENGLISH**—Elementary Discourse (Hunt's Discourse: Part I). English Language. Trench's Study of Words. Lounsbury's English Language, pp. 1-90. Lectures on Discourse and English Language. Essays. **ORATORY**—Lectures, and Drill in Elocution.

*Second and Third Terms.*

**LATIN**—Livy, (Books XXI, XXII). Roman History (Leighton's History of Rome). Cicero: De Senectute, De Amicitia. Horace: Odes. Latin Prose Composition. **GREEK**—Homer's Iliad (Books XVIII, XXII), Herodotus, Thucydides, Xenophon, selections. Outlines of Greek History. Greek Prose Composition (Sidgwick's). **MATHEMATICS**—Algebra (Wells'). Geometry (Todhunter's Euclid). Solid and Spherical Geometry. Plane Trigonometry (Loomis'). **ENGLISH**—Essays and optional courses. **FRENCH**—Grammar, with oral and written exercises.

**SOPHOMORE YEAR.**

*First Term.*

**LATIN**—Selected Letters of Cicero. Roman History from the Gracchi to Augustus. Terence: Hautontimorumenos and Andria. Tacitus: Agricola. **GREEK**—Demosthenes: the Olynthiacs and Philippics. Rhetoric of Aristotle, selections. Word-formation. Laws of Phonetic Change. Greek Composition. Euripides: The Medea. Xenophon's Memorabilia. **MATHEMATICS**—Analytical Trigonometry, Mensuration and Navigation. **ENGLISH**—Essays. **FRENCH**—Grammar completed. **HUMAN ANATOMY AND PHYSIOLOGY**. **HISTORY**—Freeman's General Sketch. **ORATORY**—Elocution. Declamation. Written Orations.

*Second and Third Terms.*

**LATIN**—Horace: Selected Satires and Epistles. Terence: Adelphoe and Andria. Catullus. Tacitus: Agricola or Histories. **GREEK**—Demosthenes: the Olynthiacs and Philippics. Rhetoric of Aristotle, selections. Word-formation. Laws of Phonetic Change. Greek Composition. Euripides: The Medea. Xenophon's Memorabilia. Dialogues of Lucian (Williams')

Selections). MATHEMATICS—Surveying. Spherical Trigonometry. Analytical Geometry. Elements of the Differential Calculus. ENGLISH—Advanced Discourse. Hunt's Discourse: Part II, or equivalent. English Language. Marsh's Origin and History of the English Language and Lectures on English Language, or equivalent. Lectures on English Language and Style. Essays. FRENCH—Syntax. Selections from George Sand, Lacombe, Corneille, Racine, Molière. ZOOLOGY AND BOTANY. ORATORY — Elocution. Declamations. Written Orations.

### JUNIOR YEAR.

#### *First Term.*

#### REQUIRED STUDIES.

PSYCHOLOGY—McCosh's Psychology and Intuitions of the Mind. ENGLISH LITERATURE—Chaucer. Lectures. Essays. PHYSICS.

#### ELECTIVE STUDIES.

*In Philosophy*—PHILOSOPHY OF HISTORY.

*In Literature*—LATIN—Juvenal's Satires, Suetonius, Select Letters of Pliny, and History of the Empire. GREEK—Aristophanes: Birds. Lectures on Greek Comedy. GERMAN—Grammar. Oral and written translations from English into German. Whitney's German Reader. ANGLO-SAXON—March's or Sweet's Anglo-Saxon Reader. Caedmon's Exodus and Daniel (Hunt). Beowulf (Harrison). Lectures on First English.

*In Science*—MATHEMATICS—Analytical Geometry.

#### *Second and Third Terms.*

#### REQUIRED STUDIES.

PSYCHOLOGY—(Concluded). LOGIC — McCosh's Manual. ENGLISH LITERATURE—Lectures. Essays. PHYSICS. ORATORY —Criticism. Written Orations. Delivery.

#### ELECTIVE STUDIES.

*In Philosophy*—PHILOSOPHY OF HISTORY.

*In Literature*—LATIN—Cicero de Legibus. Plautus: Trinummus and Mostellaria. GREEK—Phædo of Plato. Lectures.

**FRENCH**—Syntax. Racine's *Athalie*. Corneille's *Cid*. **GERMAN**—Grammar and Prose Composition. Goethe: *Hermann und Dorothea*.

*In Science*—**MATHEMATICS**—Differential and Integral Calculus. **PHYSICAL GEOGRAPHY**.

### SENIOR YEAR.

#### *First Term.*

#### REQUIRED STUDIES.

**ETHICS**—Calderwood's *Moral Science*. Lectures. **JURISPRUDENCE AND POLITICAL ECONOMY**—Lectures. **ENGLISH**—Essays. **ASTRONOMY**—Newcomb and Holden's. Lectures. **CHEMISTRY**—Lectures. **ORATORY**—Criticism. Written Oration. Public Address.

#### ELECTIVE STUDIES.

*In Philosophy*—**METAPHYSICS**. **PHYSIOLOGICAL PSYCHOLOGY**. **COMPARATIVE POLITICS**. **ARCHÆOLOGY**.

*In Literature*—**ENGLISH LITERATURE**—Shakespeare. **GREEK**—Sophocles: *Œdipus Tyrannus*. Aristotle's *Ars Poetica*. Plato: Selected Dialogues. Greek Literature and Philology. **GERMAN**—Lessing: *Nathan der Weise*, *Minna von Barnhelm*. Schiller: *Jungfrau von Orleans*. Lectures. **SANSKRIT**—Perry's *Primer*.

*In Science*—**MATHEMATICS**. **ASTRONOMY**—Practical. **PHYSICS**—Practical course in the Laboratory, or Theoretical Physics. **LABORATORY CHEMISTRY**. **BIOLOGY** or **PALÆONTOLOGY**.

#### *Second and Third Terms.*

#### REQUIRED STUDIES.

**ETHICS** (concluded). **SCIENCE AND RELIGION**—Lectures and Recitations. **JURISPRUDENCE AND POLITICAL ECONOMY**—Lectures. **ENGLISH**—Essays. **ASTRONOMY**—Newcomb and Holden's. Lectures. **CHEMISTRY**—Lectures. **GEOLOGY**—Le Conte's. Lectures.

## ELECTIVE STUDIES.

*In Philosophy*—HISTORY OF PHILOSOPHY. SCIENCE AND RELIGION—Lectures. INTERNATIONAL AND CONSTITUTIONAL LAW. Gallaudet's Manual. Lectures. HISTORY OF ART—Ancient. PEDAGOGICS.

*In Literature*—LATIN AND THE SCIENCE OF LANGUAGE—Lucretius. Lectures on General Principles of Philology and on Comparative Inflection and Syntax. Institutes of Justinian. GREEK—Sophocles: *Œdipus Tyrannus*. Greek Literature. GERMAN—Review of Grammar. Lessing: *Minna von Barnhelm*. Goethe: *Hermann und Dorothea*; *Faust*, first part. Schiller: *Jungfrau von Orleans*. Lectures on the History and Literature of the Language. SANSKRIT—Perry's Primer.

*In Science*—MATHEMATICS. ASTRONOMY—Practical. PHYSICS—Practical course in the Laboratory, or Theoretical Physics. APPLIED CHEMISTRY. BIOLOGY or PALÆONTOLOGY. HISTOLOGY.

## EXHIBIT OF STUDIES FOR THE FOUR ACADEMIC YEARS.

NOTE.—The numbers indicate hours per week.

## FRESHMAN YEAR STUDIES.

## ALL REQUIRED.

<i>First Term.</i>		<i>Second Term.</i>		<i>Third Term.</i>	
Latin,	4	Latin,	5	Latin,	5
Greek,	5	Greek,	4	Greek,	4
Math.,	4	Math.,	4	Math.,	4
English,	2	French,	2	French,	2
—		—		—	
Total hours,	15		15		15

SOPHOMORE YEAR STUDIES.

ALL REQUIRED.

<i>First Term.</i>		<i>Second Term.</i>		<i>Third Term.</i>	
Latin,	3	Latin,	3	Latin,	3
Greek,	4	Greek,	4	Greek,	3
Math.,	3	Math.,	3	Math.,	3
History,	2	English,	2	English,	2
French,	2	French,	2	French,	2
Anatomy,	1	Zoology,	1	Botany,	2
<hr/>		<hr/>		<hr/>	
Total hours,	15		15		15

JUNIOR YEAR STUDIES.

I. REQUIRED.

<i>First Term.</i>		<i>Second Term.</i>		<i>Third Term.</i>	
Physics,	4	Physics,	3	Physics,	3
English,	2	English,	2	English,	2
Psychology,	2	Psych. & Logic,	3	Logic,	3
<hr/>		<hr/>		<hr/>	
Hours req'd,	8		8		8

II. ELECTIVE.

(The student selects three subjects.)

Latin,	2	Latin,	2	Latin,	2
Greek,	2	Greek,	2	Greek,	2
Math.,	2	Math.,	2	Math.,	2
French,	2	German,	2	German,	2
History,	2	History,	2	History,	2
Anglo-Saxon,	2				
<hr/>		Phys. Geog.,	2	Phys. Geog.,	2
<hr/>		<hr/>		<hr/>	
Hours elect.,	6		6		6
<hr/>		<hr/>		<hr/>	
Total hours,	14		14		14

## SENIOR YEAR STUDIES.

## I. REQUIRED.\*

<i>First Term.</i>		<i>Second Term.</i>		<i>Third Term.</i>	
Astronomy,	4	Geology,	4		
Chemistry,	2	Chemistry,	2	Chemistry,	2
Ethics,	3				
		Sc. and Rel.,	1	Sc. and Rel.,	1
		Jur. and Pol. Ec.	2	Jur. and Pol. Ec.	4
Hours req'd.	<u>9</u>		<u>9</u>		<u>7</u>

## II. ELECTIVE.

(The student selects 6 or 7 hours.)

I. *Philosophy.*

Metaphysics,	2	Hist. Philos.,	2	Hist. Philos.,	2
Comp. Pol.,	2	Sc. and Rel.,	2	Sc. and Rel.,	2
Phys. Psych.,	2	Internat. Law,	2	Internat. Law,	2
Archæology,	2	Hist. Art,	2	Hist. Art,	2
		Pedagogics,	2	Pedagogics,	2

II. *Literature.*

Greek (O.),	2	Greek (C.),	2	Greek (C.),	2
English,	2	Latin,	2	Latin,	2
French,	2	German,	2	German,	2
Sanskrit,	2	Sanskrit,	2	Sanskrit,	2

III. *Science.*

Math.,	2	Math.,	2	Math.,	2
Pract. Astr.,	1 (2)	Pract. Astr.,	1 (2)	Pract. Astr.,	1 (2)
Physics,	1 (2)	Physics,	1 (2)	Physics,	1 (2)
Lab. Chem.,	2 (3)	App. Chem.,	1	App. Chem.,	1
Biol. or Pal.,	1 (2)	Biol. or Pal.,	1 (2)	Biol. or Pal.,	1 (2)
		Histology,	1 (2)	Histology,	1 (2)

Hours elect., 6 or 76 or 76 or 7

Tot. hours, 15 or 16

15 or 16

18 or 14

1. BIBLE, ORATORY and ESSAYS are required throughout the four years.

2. Senior Electives marked 1 (2) occupy one hour per week on the Weekly Schedule, but count as two-hour Electives, on account of extra laboratory and observatory work. *Lab. Chem.* counts as a three-hour Elective.

\* The distribution of hours in Jurisprudence and Political Economy, Astronomy, Geology and Ethics varies slightly from the regular arrangement, and holds good for this year only.

## FRESHMAN WEEKLY SCHEDULE—FIRST TERM.

	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.	SATURDAY.
I.	8½	Homer Geometry Algebra Elocution	English English Xenoph. 5p.m.	Livy Xenophon Latin Prose	Homer Livy Xenophon	Bible Algebra 9½
	10					
	11					
	3					
	4					
II.	8½	Geometry Livy Algebra	English English Xenophon	Xenophon Geometry Latin Prose	Livy Homer Xenophon	Bible Algebra 10½
	10					
	11					
	3					
	4					
III.	8½	Algebra Geometry Livy	Xenophon Livy Latin Prose	English Livy Xenophon Elocution	English Xenophon Homer	Bible Geometry 10½
	10					
	11					
	3					
	4					
IV.	8½	Livy Algebra Xenophon	Geometry Xenophon Latin Prose	English Livy Xenophon	English Geometry Homer Elocution	Bible Livy 10½
	10					
	11					
	3					
	4					



## FRESHMAN WEEKLY SCHEDULE—SECOND AND THIRD TERMS.

	MONDAY.	TUESDAY.	WEDNESDAY	THURSDAY.	FRIDAY.	SATURDAY.
I.	8½ 10 11 3 4 Livy Homer	Algebra Geometry Livy	Herodotus Horace French	Geometry Livy Homer	French Herodotus Horace	Bible Algebra 10½
II.	8½ 10 11 3 4 Homer Algebra	French Algebra Livy	Livy Horace Geometry	Homer Herodotus French	Herodotus Livy Horace	Bible Geometry 10½
III.	8½ 10 11 3 4 Algebra Livy	Homer Livy Algebra	Geometry French Horace	Livy Homer Herodotus	Geometry Horace French	Bible Herodotus 10½
IV.	8½ 10 11 3 4 Homer Geometry	Livy Algebra French	Algebra Herodotus Horace	French Geometry Homer	Livy Horace Herodotus	Bible Livy 10½

SOPHOMORE WEEKLY SCHEDULE—FIRST TERM.

MONDAY.		TUESDAY.		WEDNESDAY.		THURSDAY.		FRIDAY.		SATURDAY.	
I.	8½	Math. French } French } Math.	Latin (P.)	History	Latin (P.)	Latin (P.)	Anat. & Phys.	Greek (O.) Greek (O.) } Greek (O.) }	Greek (O.) History	Bible French } French }	
	10										
	11										
	3										
	4										
II.	8½	Math. Latin (W.) Latin (W.) Math.	Latin (W.)	History	Latin (W.)	Latin (W.)	Anat. & Phys.	Greek (C.) Greek (C.) }	Greek (W.) History French }	Bible Greek (W.)	
	10										
	11										
	3										
	4										

SECOND AND THIRD TERMS.

	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.	SATURDAY.
I.	8½	English French } French }	French }	Greek (W.)	Greek (C.)*	Bible Latin (W.)
	10		French }	Latin (W.)	English	
	11		Zool. & Bot.	Latin (W.)	Greek (C.) }	
	3		Greek (W.)	Greek (O.)	Greek (C.) }	
	4		Zool. & Bot.	French }	English	
II.	8½	Latin (P.) English Math.	Latin (P.)	Greek (O.)	Greek (O.) }	Bible French } French }
	10		Latin (P.)	French }	Greek (O.) }	
	11		Latin (P.)	French }	Greek (O.) }	
	3			Greek (O.) }	Greek (O.) }	
	4		Latin (P.)	Greek (O.) }	Greek (O.) }	

\* Botany, third term.

JUNIOR WEEKLY SCHEDULE—FIRST TERM.

	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.	SATURDAY.
8½	PHYSICS	PHYSICS	PSYCHOLOGY	Latin	Latin	BIBLE
10				Anglo-Saxon	Anglo-Saxon	
11	Greek	Mathematics	PSYCHOLOGY	Mod. Lang.	Mod. Lang.	ENGLISH
3	Greek	Greek			Mathematics	
4	PHYSICS	PHYSICS	Hist. (5 p. m.)	History	ENGLISH	

SECOND AND THIRD TERMS.

8½	PHYSICS	PSYCHOLOGY <sup>1</sup> LOGIC <sup>2</sup>	PSYCHOLOGY <sup>1</sup> LOGIC <sup>2</sup>	Latin	Latin	BIBLE
10				Mod. Lang.	Phys. Geog.	
11	Greek	Mathematics	PSYCHOLOGY <sup>1</sup> LOGIC <sup>2</sup>	Phys. Geog.	Mod. Lang.	ENGLISH
3	Greek	Greek			Mathematics	
4	PHYSICS	PHYSICS	History	History	ENGLISH	

<sup>1</sup> Until Feb. 1st.      <sup>2</sup> From Feb. 1st.

## SENIOR WEEKLY SCHEDULE—FIRST TERM.

	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.	SATURDAY.
8½	ASTRONOMY	ASTRONOMY	Physics Biology	Theor. Physics Comp. Politics	French Archæology	BIBLE
10	Pract. Astron.		Metaphysics	Archæology	Greek (O.)	Paleontology
11	Metaphysics	ETHICS	ASTRONOMY	English	English	CHEMISTRY
3	Greek (O.)			French	Comp. Politics	
4	ETHICS	ASTRONOMY		Lab. Chemistry		
5		Lab. Chemistry				

## SECOND AND THIRD TERMS.

	JUR. and POL.	JUR. and Pol.	GEOLOGY	Int. and Const. Law	German	BIBLE
8½	JUR. and POL.	JUR. and Pol.	GEOLOGY	Int. and Const. Law	German	BIBLE
10	Pract. Astron.			Hist. Phil.	Greek (C.)	Paleontology
11	Hist. Phil.	GEOLOGY	Sci. and Rel.	Latin	Latin	CHEMISTRY
8	Greek (C.)		Physics Biology	German Histology	Int. and Const. Law	
4	GEOLOGY	GEOLOGY	{ Sci. & Rel. Hist. of Art.	Applied Chem. Pedagogics	CHEMISTRY	

The hours for *Mathematics* and *Sanskrit* and one hour in *Pedagogics* are to be arranged by the Professors in charge.

Bracketed electives are mutually exclusive.

GEOLOGY this year ceases at end of second term and in third term JUR. AND POL. replaces two of its hours. See p. 87.

## EXAMINATIONS, STANDING AND GRADUATION.

### EXAMINATIONS.

*Regular Examinations.*—At the end of each term each class is ordinarily examined in the studies of that term. At the close of the third term the examination in certain subjects embraces not only the work of that term, but the course of the entire year.

*Partial Examinations and Written Recitations.*—In addition to the regular examinations, partial examinations or written recitations are held from time to time during the term.

*Divisional Examinations.*—In the Freshman class, a special examination is held early in the first term, the results of which determine the distribution of the class into graded divisions. These are reorganized at the beginning of the second and third terms, according to the results of the last preceding regular examination.

*General Regulations.*—Examinations are for the most part conducted in writing, but in certain subjects are oral in whole or in part. Private examinations are not allowed except in extreme cases, and by special permission of the Faculty. Absence from an examination, except for reasons of absolute necessity, will be regarded as a serious delinquency, and a subsequent examination will not be granted except by a vote of the Faculty.

#### *Regulations in Respect to the Removal of Conditions.*

Students who shall appear to the Faculty, on examination, to be deficient in their studies, will be dealt with according to the nature and extent of the deficiency. Any member of any one of the three lower classes who shall fail to pass the exami-

nations at the end of any term in more than two departments, involving as much as six hours of schedule time, shall be dropped from his class and shall be required to enter a lower class or to withdraw from College. If the failure be in not more than two departments, the student may be allowed a second trial at the beginning of the next term; if he fail in this second examination, he shall employ a tutor approved by the Faculty, and be allowed four weeks for further preparation; but if he still fail to pass, he shall be required to enter a lower class or withdraw from College.

In the Freshman class, failure with either instructor in Greek, in Latin, or in Mathematics, is reckoned as a separate failure in the application of the above rules.

The Senior class will be subject to the same regulations as the three lower classes so far as regards the examinations at the close of the *first* term, and the removal of any conditions then incurred.

In the application of these regulations, special cases, arising from illness or other causes, will be duly considered.

*On the second day of each term, Thursday, at 10 o'clock, A. M., all delinquent or unexamined students are required to meet in the Old Chapel to make arrangements with their instructors for examination in the subject in which they are deficient. This does not apply to entering students.* In the first term, this examination is to take place immediately at the beginning of the term; in the second and third terms, two weeks are allowed for it. Any student not present as thus directed, or not prepared for examination at the time appointed, will be debarred from another opportunity, except by special vote of the Faculty.

### STANDING.

The results of the term examinations are combined with those of the recitations to decide the relative standing or rank of the student. The maximum mark in each study is one hundred; the minimum or passing mark is fifty. Students falling below the passing mark in any study are conditioned, and in order to continue with the class must be re-examined.

Each instructor after computing from recitations and examinations the marks of his classes determines each student's rank by assigning him to one of six *groups* into which the class is divided. These groups are constituted and numbered in order of merit—those students whose marks indicate the highest attainments being assigned to the first group, the next highest to the second group, and so on through the six groups. The first group is to contain not less than one-thirtieth, nor more than one-tenth of the class; the second, fourth and fifth groups each not more than one-fifth; the third not more than one-fourth; and the sixth group comprises the remainder of the class, except those not fully examined.

The general rank of a student is determined by combining his group-numbers in the several studies in proportion to the allotted schedule time of each. Those students whose averages are highest, and above an established limit, are assigned to the first general group, those next highest to the second general group; and so on, through the six general groups.

The first and second general groups for the year, of the Junior, Sophomore and Freshman classes, constitute the Honor groups of these classes, and are published in the Catalogue of the following year—the names included in each group being printed in alphabetical order.

In determining a student's standing, essays count as one hour per week throughout each of the four years. Account is taken of attendance and conduct as well as scholarship, according to the published rules of the Faculty.

A report of the standing of each student is made to his parent or guardian by the Registrar of the College at the close of the first term and at the close of the year. The latter report gives also the standing for the whole year.

## GRADUATION.

### *Bachelor's Degree.*

Students who pass their final examination are ordinarily recommended by the Faculty for the degree of Bachelor of Arts, and if the recommendation is approved by the Trustees, the

degree is conferred at Commencement, and they receive diplomas signed by the President and the Clerk of the Board of Trustees.

No student will be recommended to the Trustees for a degree who fails to pass the examinations at the close of the last term of the Senior year.

Any member of the Senior class failing to pass the regular final examination in but *one* of his studies may, by vote of the Faculty, be allowed a re-examination, and if successful in passing this, may be recommended to receive his degree with his class.

Any member of the Senior class failing to pass the regular final examination in *two* of his studies may, by vote of the Faculty, be allowed a re-examination, and if successful in this may be recommended for a degree *at some time in the next Academic year*.

#### *Final Rank and Graduation Honors.*

The final rank of members of the graduating class is computed by combining the averages for the several years of the course. The Faculty then determines what portion of the class shall be printed as the Honor List—the names of the members of each group of the Honor List being printed in alphabetical order.

The first and second general groups thus determined are the Honor groups of the graduating class, and are designated *magna cum laude* and *cum laude* respectively.

The higher distinction of *insigni cum laude* and the highest of *summa cum laude* are reserved for very unusual excellence.

#### *Commencement Appointments.*

Commencement orations and theses, indicative of general or special excellence, are awarded by the Faculty to such students as are deemed worthy of distinction. The student whose individual rank is highest is ordinarily awarded the Latin Salutatory by vote of the Faculty. In like manner the student whose individual rank is the next highest receives the English Salutatory. The Valedictory is awarded with special regard to the qualifications of the student as a valedictorian, as well as on the ground of scholarship. Orations and theses designated as Philosophical, Classical, Mathematical, Physical, Metaphysical, Ethical, Historical, Literary, Belles Lettres, Modern Language,



are awarded to students eminent in the corresponding departments.

In the award of all degrees and honors, regard is had to the conduct of the student during his course, and any student who has incurred serious discipline may be debarred from the rank to which otherwise his scholarship would have entitled him.

T H E  
JOHN C. GREEN SCHOOL OF SCIENCE.

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FOUNDATION AND ORGANIZATION.

This institution is a department of the College of New Jersey, founded in 1878 upon an endowment by Mr. John C. Green.

Its design is to furnish more extended and special instruction in the natural sciences, providing several scientific courses leading to the degree of Bachelor of Science and also various graduate courses. The course in Civil Engineering was added in 1875, by further endowment from the residuary legatees of Mr. Green.

The undergraduate courses offer, according to the choice of the student, efficient education in the natural sciences in general, or a thorough training in the study of civil engineering and in various other branches of science, pure and applied. At the same time a liberal education in certain academic studies is secured to all candidates for a degree.

Graduate courses of study for the degrees of Master of Science and Doctor of Science are provided; and also special courses which, under certain conditions, may be taken by students who are not candidates for any degree.

Instruction is given by lectures and recitations—by practice in the laboratories, drawing-rooms, museums and field—and excursions are made to different points of interest.

Before receiving his degree every student must present to the Faculty an acceptable thesis on some scientific subject, the nature of which will depend upon the course he has pursued.

## ADMISSION.

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### ENTRANCE EXAMINATIONS.

All entering students on their arrival must report at the President's house, and register. The first examination for admission will begin in Princeton on Thursday, June 21st, 1888, at 11 A. M., and will continue through the afternoon of Friday. The second will begin on Tuesday, September 11th, at 11 A. M., and continue through the afternoon of Wednesday. Applicants who have conditions or other deficiencies from the June examination are expected to remove them at this time. *Attendance is required at the beginning of the examinations.*

Simultaneously with the June entrance examinations in Princeton, examinations are held in the following cities, viz. : Pittsburgh, Cincinnati, Louisville, Chicago, St. Louis, Omaha, Denver and San Francisco, and at preparatory schools and other cities when necessary. The precise places in which the examinations are to be held can be learned by application to the President: Due notice of these examinations will also be published in leading local newspapers for several weeks in advance.

Examinations at other times and places than those specified are very inconvenient and often impracticable, and applicants for examination at other than the regular days are required to pay \$10 into the treasury.

At the examinations in June, candidates intending to enter the Freshman class one year later are admitted, on request, to examination on a portion of the subjects required for entrance. Applications for such preliminary examination should be made to the President, with a statement of the subjects and amount offered, at least two weeks previous to the examination.

Candidates for admission to the Freshman class must be at least sixteen years of age. They will be examined in the following books and subjects :

**ENGLISH:** Grammar—Whitney, or Reed and Kellogg (Higher Lessons); Modern Geography—Guyot's Grammar-School Geography; U. S. History—Anderson's or Johnston's; Essay—the theme for 1888 will be based on the life of Longfellow or of Faraday. The attention of preparatory schools is called to the need of a more thorough study of elementary English. **MATHEMATICS:** Arithmetic entire, including the Metric system, a practical knowledge of which is indispensable; Algebra, through quadratic equations involving two unknown quantities, including evolution, radicals, theory of exponents; Geometry—plane geometry entire (five books of Chauvenet's Geometry or their equivalent). **FRENCH:** The elements of Grammar (Otto, pp. 28-201, or Delille's Condensed Instruction, pp. 11-148), and the translation of fifty pages of simple French prose. **PHYSICAL GEOGRAPHY:** The elements, as contained in Guyot's Grammar-School Geography.

Candidates for the degree of Bachelor of Science will be examined (in addition to the subjects above enumerated) in **LATIN:** Grammar, with special attention to parsing, and the retranslation from English into Latin of simple sentences from the First Book of Cæsar; Translation, Cæsar (five books of the Gallic War), Cicero (the four orations against Catiline), or equivalents from other Latin authors.

It is recommended that *all* candidates should receive instruction in free-hand drawing before their entrance.

#### OTHER REQUIREMENTS.

Candidates for admission to an advanced class will be examined in the studies previously pursued by the class they propose to enter.

All candidates for admission must bring satisfactory testimonials of moral character, and if the candidate has been a member of another college, university, or similar institution, he must produce a certificate from its President or Faculty that he is free from censure in the same.

No candidate is admitted without an examination and a vote of the Faculty.

Immediately after the opening of the College the entering students meet according to announcement for the registration of their names and subscription to the following pledge, required by the Board of Trustees :

We, the undersigned, do individually for ourselves promise, without any mental reservation, that we will have no connection whatever with any secret society, nor be present at the meetings of any secret society in this or any other college so long as we are members of the College of New Jersey; it being understood that this promise has no reference to the American Whig and Cllosophic Societies. We also declare that we regard ourselves bound to keep this promise and on no account whatever to violate it.

## UNDERGRADUATE COURSES.

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Undergraduate courses are provided for the degrees of Bachelor of Science, and of Civil Engineer.

All candidates for the degree of Bachelor of Science pursue the same studies until the end of the first term of the Junior year, after which they pursue one of the following five Elective Courses: General Science; Chemistry and Mineralogy; Biology and Chemistry; Biology and Geology; Mathematics and Mechanics.

The student must announce his election before the end of the first term of the Junior year. He cannot afterwards change his course without the permission of the Faculty.

Candidates for the degree of Civil Engineer pursue some studies in common with candidates for the degree of Bachelor of Science, but the divergence of the two courses commences at the very beginning.

*Special Students.*—For persons who may desire to devote special attention to any of the scientific studies of the School, arrangements can be made with the Professors of those branches, if the Professor in charge shall, after due investigation, decide that the applicants can pursue such studies with advantage. Every facility will be offered for their advancement in the studies selected, with the personal supervision of the Professor and full access to the collections, etc.; but it must be distinctly understood that this opportunity is intended only for those who desire to obtain proficiency in special branches, and not for students who have failed to keep up with the regular classes. Special students will be required to give evidence of satisfactory progress in their studies. To those passing successful examinations in the branches selected, certificates of proficiency will be given. The branches open to special students include geology, mineralogy, biology, physics, practical astronomy, analytical and applied chemistry, assaying, topography.

## **COURSES FOR THE DEGREE OF BACHELOR OF SCIENCE.**

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### **STUDIES IN COMMON.**

#### **Modern Languages.**

**PROFESSOR HUSS.**

Instruction in Modern Languages comprises German and French as required studies throughout the entire course, the number of exercises being given in the synopsis on a later page.

In the Freshman year the student begins and completes the etymological part of German grammar. The instruction is, at the very outset, conducted with a view to familiarizing the student not only with reading and writing, but also with speaking the foreign idiom; for which latter purpose conversational exercises are constantly resorted to and especial attention is given to pronunciation. In French, the etymology of grammar is reviewed.

In the Sophomore year the instruction bears on syntax, with oral and written exercises in French and German prose, particular attention being given to the intricacies of the German period.

The Junior year and the first two terms of the Senior year are devoted to a critical study of the masterpieces of German and French literature, with lectures thereon.

#### **Mathematics.**

**PROFESSOR ROCKWOOD.**

The Mathematical course, which is the same for all students of the School of Science, is intended to be so framed as to supply the necessary foundation in knowledge and training for the later studies of physics and mechanics, and especially finds its natural continuation in the applied mathematics of the course in Civil Engineering. The fact that the student's mathematical knowledge is thus to be used in other departments is carefully kept in view, not only in selecting the subjects to be studied, but in arranging their order and the relative time to be devoted to

each, so that he may be properly prepared for the work before him. Constant black-board practice is a prominent feature of the instruction, and gives the student a practical as well as a theoretical familiarity with the processes, preparing him for their ready use afterward in the special investigations of his later studies.

The student is required, at the entrance examination, to be acquainted with arithmetic, including the Metric system; algebra through quadratic equations, including radicals and the theory of exponents; and with the principles of plane geometry as developed in the first five books of Chauvenet's Geometry.

During the whole of the first year the student devotes five hours a week to mathematics. In the first term he finishes the study of algebra (Wells'), discussing the various forms of series, the subject of logarithms and the theory of equations.

In the second term solid geometry and spherical geometry are studied, the text-book being Chauvenet's treatise, and the subject being illustrated by a numerous and valuable collection of models, mostly from original designs. With the geometry is combined a thorough course in mensuration and an introduction to the elements of modern geometry. The third term is devoted to plane trigonometry, in which the student becomes accustomed to the practical use of logarithms, and a part of the first term of the Sophomore year is given to spherical trigonometry and its applications. The remainder of the first term and the second and third terms of the Sophomore year are devoted to the study of analytical geometry (Bowser), both of the plane and of space, with special reference to the conic sections. In the first term of the Junior year the differential and integral calculus (Bowser) are studied, with five exercises a week. Throughout the whole course, the black-board drill is combined with abundant oral explanation and occasional formal lectures.

The calculus ends the course in the pure mathematics required of all students. They pass then to the applications of their work in the special departments of engineering, physics, astronomy, etc. Provision is, however, made for the further



special study of the subject by the elective course in Mathematics and Mechanics.

### Graphics.

PROFESSOR WILLSON.

**MECHANICAL AND FREE-HAND DRAWING.** — The object of the course in free-hand drawing is to furnish the training necessary to the making of such sketches or designs as are ordinarily required in the practice of the engineer or biologist. It is followed by a course in practical geometrical and engineering drawing, beginning with instruction in the use of drafting instruments and materials; tinting and shading, both with pen and brush; lettering, and the representation of metals, wood, masonry, earth, tiles and other materials of architectural and engineering construction. Architectural drawings and tracings are then made, to scale, from measurements, also "working drawings" of details of machinery, bridges, etc., from free-hand sketches taken by the students. The course further includes the solution of the more important plane problems involving only the straight line and circle; the tracing of point paths in link motions; the graphical construction of the conic sections and of various trochoidal and other higher plane curves, in connection with which their most interesting geometrical properties are examined; the solution of problems in orthographic projection (first angle); axonometric (including isometric) projection, with applications in crystallography, in drawing from architectural and other models, and also from data derived from working drawings.

In conducting the above courses much of the instruction is given orally, but in connection with portions of the work the following books are used: Warren's Elementary Projection Drawing; Warren's Drafting Instruments and Operations, and either Prang's, Copley's or Ames' Alphabets. The courses occupy four two-hour exercises during each week of the first term of Freshman year and three similar exercises per week during the second term.

**DESCRIPTIVE GEOMETRY AND SHADES AND SHADOWS.**—A course of fifty-two exercises (two hours each) in the first term of Sophomore year, on the elementary problems of the point, line and plane in the four angles ; on developable, double-curved and warped surfaces ; trihedrals ; the projection of shadows, etc. Text-book : Warren's Descriptive Geometry.

**PERSPECTIVE AND SPHERICAL PROJECTIONS.**—Three two-hour exercises per week in the third term of Sophomore year. In the course in perspective the methods employed in the present practice of the best American architects are studied and applied. Text-books : Warren's Descriptive Geometry ; Wright's Architectural Perspective. Reference work : Ware's Modern Perspective. In spherical projections, descriptive geometry is applied in the more important methods of map projection, as the stereographic, Mercator's, polyconic, etc. Text book : Warren. Reference works : Craig's Projections, Germain's Spherical Projections.

All the courses outlined above are taken by C. E. and B. S. students alike. Students in the Civil Engineering course have additional work in graphics in the Sophomore and Senior years, regarding which see details of that course.

**ELECTIVE COURSES.**—Stereotomy (see course in Civil Engineering), may be elected by any student taking the elective course in General Science or in Mathematics and Mechanics.

**DRAFTING ROOM AND MODELS.**—The recitation and drafting room of the department of Graphics is well lighted and furnished with model cases and with desks for the accommodation of ninety-two students. The drawing courses in descriptive geometry, perspective, shades and shadows, architectural constructions (including stone-cutting), kinematics, and machinery, are illustrated by a large collection of models, which includes a number of duplicates of the Olivier ruled-surface models, two hundred from the Messrs. Schröder, of Darmstadt, complete sets of the mathematical models designed by Professors Brill and Björling, a number of the "Muret" plaster models, and several warped surface models from designs by the professor.

### **Surveying.**

**PROFESSOR McMILLAN.**

This course, occupying twenty exercises in the first term of the Sophomore year, is designed to teach the student the outlines, principles and applications of the different subdivisions of geodesy, and to familiarize him, in a general way, with surveying practice. Field exercises are intermingled with the recitations, and the subject is thus rendered more intelligible and attractive.

### **General Chemistry.**

**PROFESSOR SCHANCK.**

The instruction in this study occupies two hours a week during the Sophomore year, being the same as that in the required course in general chemistry, of the Academic classes. For the current year the Freshman Class also attends a course in general chemistry under Professor Schanck occupying two hours a week.

### **Analytical Chemistry and Mineralogy.**

**PROFESSOR CORNWALL AND DR. MCCAY.**

**MINERALOGY.**—The elements of crystallography are taught by a course of lectures in the second and third terms of the Freshman year. Determinative mineralogy, with the blowpipe, is taught during the whole of the first term of the Sophomore year, in a course of forty-five exercises (two hours each). In the Senior year a course of lectures on descriptive mineralogy, with practice in the determination of minerals by their physical characteristics, together with the optical study of minerals and rocks, may be elected by the students in the course in General Science.

**ANALYTICAL CHEMISTRY.**—During the second and third terms of the Sophomore year, the students attend lectures by Professor Cornwall, with recitations, and also work in the laboratory, under Dr. McCay, pursuing the study of qualitative

chemical analysis, with Fresenius' Manual as a guide. Seventy-seven exercises (of two hours each) are given to the study of the detection of bases, together with instruction in the tests for the common acids, inorganic and organic. The subjects given during the Junior and Senior years are indicated in the Synopsis of Studies on a later page.

### **Botany.**

**PROFESSOR MACLOSKIE.**

Botany is a required study during the third term of the Freshman year and the first term of the Sophomore year, and occupies sixty-seven exercises (two hours each). The work of the class is exclusively practical, and includes the examination of plants as to their morphology, histology, modes of development, and physiology. Students are taught to use their hands and eyes, to avail themselves of microscopical appliances, to master the characters of the larger orders of plants, and are exercised in phytography by describing and drawing what they see. The text-books and manuals are used for reference, but each student is required to prepare his own text-book by noting down the results of his own examination of typical plants. Botanical excursions are made in the spring season to the surrounding districts, and an original thesis on some botanical subject is required of each student. Books recommended: Macloskie's Elementary Botany; Gray's Manual of Botany; Bessey's Briefer Course Botany. Books of reference: Sach's Text-Book of Botany; Eichler's Blüthendiagramme; H. Müller's Fertilization of Flowers; Le Maout and Decaisne's Botany; Bentham and Hooker's Genera Plantarum; De Candolle's Prodrromus; Monographs on special groups of flowering and flowerless plants.

### **Biology.**

**PROFESSORS MACLOSKIE, LIBBEY AND OSBORN.**

During the Sophomore year all candidates for the degree of Bachelor of Science have an elementary course in zoology, consisting of thirty-seven exercises, during the second and third

terms. The studies of the second term, under Professors Macloskie and Osborn, consist of lectures and practical work upon the invertebrates and vertebrates. In the second and third terms Professor Libbey gives a course in histology and use of the microscope. During the second term of Junior year Professor Osborn gives a course of lectures upon the comparative anatomy and physiology of the birds, accompanied by an introductory course of dissection of the pigeon.

These required courses are introductory to the elective courses in Biology and Chemistry and Biology and Geology of the Junior and Senior years.

### **Studies Pursued in Common with the Academic Classes.**

The following studies are pursued either together with the Academic classes, or essentially as stated under the corresponding titles in the Academic course, and under the same instructors.

Psychology; political economy; English literature, the essays and orations required from the Senior class in the Academic course being replaced in the Scientific course by the preparation and reading of theses on scientific subjects; rhetoric and English language; oratory; physics; astronomy; geology; human anatomy and physiology.

### **COURSE IN GENERAL SCIENCE.**

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This is one of the five courses leading to the degree of Bachelor of Science and is intended to afford instruction in science without specializing in any one department. The students electing it enter upon the special studies of the course at the beginning of the second term of their Junior year. Beside the studies required of all candidates for the degree of Bachelor of Science the following studies are pursued during the Junior and Senior years :

**ANALYTICAL MECHANICS.**—This is taken with the class in the course in Civil Engineering and occupies four exercises a week through the second and third terms of the Junior year.

**ANALYTICAL CHEMISTRY.**—This consists of laboratory work and recitations, with special reference to problems in chemical physics. It occupies three exercises a week during the first term of the Senior year.

**PRACTICAL PHYSICS.**—This is essentially the same as the elective course in the Senior year of the Academic department (p. 75), but is more extended, occupying two exercises a week throughout the Senior year.

**PHYSICAL GEOGRAPHY.**—This occupies two exercises a week through the second and third terms of the Senior year, and is taken with the Junior class of the Academic department (p. 78).

In the Senior year the student is allowed liberty of choice from the following groups, the conditions being that the studies chosen shall occupy four exercises a week throughout the Senior year, and that no group be broken :

**GROUP A. *Practical Astronomy.***—This is the same as the Senior elective in the Academic department (p. 73) and occupies one exercise a week throughout the year.

**GROUP B. *Mathematical Physics.***—This occupies one exercise a week throughout the year.

**GROUP C. *Comparative Politics.***—This is the same as the Senior elective in the Academic department (p. 57), and occupies two exercises a week during the first term.

***International and Constitutional Law.***—This is the same as the Senior elective in the Academic department (p. 58), and occupies two exercises a week through the second and third terms.

**GROUP D. *Physiological Psychology.***—This is the same as the Senior elective in the Academic department (p. 54), and occupies two exercises a week during the first term.

*Biology and Morphology.*—This consists of advanced laboratory work with Professor Macloskie and Professor Osborn, and occupies two exercises a week through the second and third terms.

GROUP E. *Archæology.*—This consists of lectures on the history of Christian architecture, and occupies two exercises a week during the first term (p. 60).

*History of Greek Art.*—This occupies two exercises a week through the second and third terms (p. 60).

*Strength of Materials.*—This is taken with the Senior class in the course in Civil Engineering and occupies two exercises a week during the first term.

*Stereotomy.*—This is taken with the Senior class in the course in Civil Engineering and occupies two exercises a week through the second and third terms.

## COURSE IN CHEMISTRY AND MINERALOGY.

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This course is designed to afford thorough instruction in analytical and technical chemistry, and students electing it enter upon the special studies of the course at the beginning of the second term of their Junior year. Beside the studies required of all candidates for the degree of Bachelor of Science, the following special studies are taken during the Junior and Senior years :

**QUALITATIVE ANALYSIS.**—This subject, previously pursued in the Sophomore year, is continued, so as to include the detection of inorganic and organic acids as well as bases, in complex substances.

**QUANTITATIVE ANALYSIS.**—A full course, including the analysis of chemical and metallurgical products, ores, fertilizers, sugar, water, etc. Volumetric methods are freely used whenever they are appropriate.

**ASSAYING.**—Furnace assay of ores; Bullion assays.

**BLOWPIPE ANALYSIS.**—Qualitative (required); Quantitative (optional).

**TECHNICAL CHEMISTRY and APPLICATIONS OF CHEMISTRY** to medicine and hygiene, including toxicology, analysis of potable waters, adulterations of food, disinfectants. Lectures and recitations.

**MINERALOGY.**—Descriptive and determinative (the latter chiefly based upon the physical characters of the minerals).

**LITHOLOGY.**—Descriptive and determinative, with microscopical examination of typical rocks.

In the above subjects the instruction embraces lectures by Professor Cornwall, with recitations upon the lectures and upon portions of the manuals mentioned below, and also laboratory practice (except in technical chemistry) under the Professor and Dr. McCay; the latter lecturing also upon volumetric analysis. All chemical reactions are fully explained by the use of chemical formulas, and the student must show that he understands the theory of all the operations he performs or describes.

The graduation thesis presented by the student must embody the result of the student's own work in the laboratory, whether it be experimental or analytical.

**Text-books.**—Fresenius' Manuals of Qualitative and Quantitative Chemical Analysis; Ricketts' Notes on Assaying; Cornwall's Blowpipe Analysis. Reference is frequently made to other works and to scientific periodicals.

## **COURSE IN BIOLOGY AND CHEMISTRY.**

This course is recommended to students who intend afterwards to pursue the study of medicine. The special studies of the course begin with the second term of the Junior year, half of the time devoted to such studies being allotted to biology and half to chemistry. For the present year the division is made as follows:



**I. BIOLOGY.**—In this branch Professor Macloskie gives a series of exercises on the anatomy of type forms of invertebrate animals, on comparative physiology, and on the morphology and embryology of plants. The text-books recommended are: Packard's Zoology, Foster's Physiology, Brooks' Handbook of Invertebrate Zoology, Huxley on the Cray-fish, Balfour's Comparative Embryology, Leidy's Freshwater Rhizopods, Macloskie's Elementary Botany, Bessey's Botany, Sach's Botany.

Professor Osborn, with Mr. Phillips, conducts two exercises a week during the second and third terms of the Junior year, and two a week during the second and third terms of the Senior year. This portion of the work is intended as an introduction to the study of human anatomy and embraces a thorough course in dissection and study of the skeleton of the cat and rabbit, employing the text-books of Parker (Zootomy) and Wiedersheim (Comparative Anatomy). There is also a course of lectures upon embryology in third term of each year, with practical work upon the development of the chick and frog.

During second and third terms Professor Libbey conducts one exercise a week in histological methods, in which the class are required to work practically upon subjects assigned, and to present theses upon the results obtained.

**II. CHEMISTRY.**—This part of the course will embrace classroom exercises under Professor Cornwall and laboratory work under his supervision, with the aid of Dr. McCay. After learning how to make quantitative analyses of a number of simple and complex inorganic substances, by the use of gravimetric and volumetric methods, the students will study the properties of the various typical organic compounds, such as alcohols, carbohydrates, acids, etc., as well as of fats, urea, milk and other bodies of interest to the student of physiological chemistry, and will be trained in the methods of analyzing and estimating the same, reference being made to appropriate manuals and current scientific literature. Lectures will also be given upon the applications of chemistry to medicine and hygiene, including toxicology, analysis of potable waters, adulteration of food, disinfectants, and similar subjects.

## COURSE IN BIOLOGY AND GEOLOGY.

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The special objects of this course are to qualify students who elect it to become original investigators or teachers of the special branches of science included in it.

The special studies in biology and geology begin with the second term of the Junior year. The course embraces the following subjects :

I. ZOOLOGY, during Junior and Senior years, including comparative anatomy, osteology, and embryology ; 149 exercises. Professor Macloskie.

II. COMPARATIVE ANATOMY OF THE VERTEBRATES, during Junior and Senior years ; 94 exercises. Professor Osborn and Mr. Phillips.

III. HISTOLOGY, during second and third terms of Sophomore, Junior and Senior years ; 60 exercises. Professor Libbey.

IV. PALÆONTOLOGY, during Senior year. Professor Scott.

Instruction is also given in the following branches of natural history :

Physiology, during Senior year ; 35 lectures. Professor Macloskie.

Geology, during Senior year ; 38 lectures. Professor Scott.

Physical Geography, during Junior year ; 40 lectures and recitations. Professor Libbey.

Botany (optional). Professor Macloskie.

### I. ZOOLOGY.

In this branch, which occupies the second and third terms of Junior year, and continues during the whole of Senior year (two or three recitations weekly), Professor Macloskie gives a series of practical exercises with recitations on the different groups of invertebrate animals, using as type-forms for study, amoeba, hydra, planaria, the earth-worm, crayfish, cockroach, mussel and ascidian ; and on comparative physiology, using Huxley's and Foster's text-books, with the actual examination

of the structure and functions of the organs. Other text-books used in this course are Huxley's *Anatomy of Invertebrate Animals*, Brook's *Hand-book of Invertebrate Zoology*, Huxley on the Crayfish, Packard's *Zoology*, Mivart on the Cat, Flower's *Osteology of the Mammalia*, Parker on the Shoulder Girdle, Leidy's *Freshwater Rhizopods of North America*, Balfour's *Comparative Embryology*.

## II. THE COMPARATIVE ANATOMY OF THE VERTEBRATES.

(1) The Birds; their skeleton, muscles, brain, digestive and vascular systems, as modified for their peculiar habits of feeding and flight. This course is given in the second term of Junior year. (2) The Mammals; their anatomy studied by inter-comparison and by the light thrown upon it by the anatomy of reptiles, fishes and birds. This course includes the elementary embryology of the chick and frog, also the development of the skull. The course in embryology follows the early chapters of Foster and Balfour's work, and chick embryos are obtained by means of an incubator. The works of Huxley, Balfour and Parker are employed. The principal feature of the course is the laboratory work and the constant practice in drawing from the specimens and dissections.

## III. HISTOLOGY.

This subject embraces a study of the normal tissues, and covers as wide a range as possible in the vertebrate kingdom. Special attention is directed to the methods of microscopical work both in the management of the instrument and in the processes of injecting, preserving, staining and mounting specimens, the student being required to perform these operations for himself. The laboratory is open at all hours for private investigation on the part of the student, and material is provided.

The regular exercises are held from 2 to 5 P. M. on Wednesday of each week during the second and third terms of Sophomore, Junior and Senior years. A fee of \$10 is charged to cover the expense of mounting material, slides, cover glasses, etc.

## IV. PALÆONTOLOGY.

This study extends through the Senior year for those students who elect Biology. It includes practical work in the E. M. Museum, the collections of which offer every facility for the thorough pursuit of this subject. Sufficient undescribed material is in the E. M. Museum to offer those students who desire to take a palæontological subject for their graduation theses abundant opportunity to do so.

## COURSE IN MATHEMATICS AND MECHANICS.

The required studies in this elective course are the same as those required of all other candidates for the degree of Bachelor of Science, but after the beginning of the second term of the Junior year, students electing the course in Mathematics and Mechanics will pursue such of the studies named below, and in such order, as may be determined from time to time by the Professor of Mathematics in the School of Science, the Professor of Mechanics and the Professor of Physics.

Rational mechanics; mathematical theory of fluid motions; mathematical theory of strength of materials; thermodynamics; higher analytical geometry and calculus; quaternions; method of least squares; stereotomy; practical astronomy; practical physics.

## SYNOPSIS OF COURSES.

The studies of the courses leading to the degree of Bachelor of Science are indicated in the following synopsis, the bracketed figures denoting the number of exercises in each subject.

## FRESHMAN YEAR.

*First Term.*

MATHEMATICS: Algebra completed (Wells'); [65]. ENGLISH: Elementary Discourse; Hunt's Discourse, (Part I); Trench (Study of Words); Lounsbury's English Language, pp.

1-90; Lectures and Essays; [26]. MODERN LANGUAGES: German: Huss' System of Oral Instruction; [39]. GENERAL CHEMISTRY: Inorganic; [26]. DRAWING: Mechanical and Free-hand; [52]. ORATORY: Lectures and Drill in Elocution.

*Second and Third Terms.*

MATHEMATICS: Solid and Spherical Geometry (Chauvenet); Mensuration; Plane Trigonometry; [95]. MODERN LANGUAGES: German: Huss' System of Oral Instruction, completed; French: Delille's Condensed Instruction; [81]. GENERAL CHEMISTRY: Inorganic; [38]. BOTANY: Flowering Plants; Morphology of Plants (Macloskie's Botany); [35]. DRAWING: Projections (Warren's); [36]. MINERALOGY: Crystallography; [19]. ENGLISH: Essays.

SOPHOMORE YEAR.

*First Term.*

DESCRIPTIVE GEOMETRY AND SHADES AND SHADOWS; [52]. MINERALOGY: Determinative; [45]. HUMAN ANATOMY AND PHYSIOLOGY; [13]. GERMAN: Syntax; FRENCH: Syntax; also oral and written exercises in both languages; [47]. MATHEMATICS: Spherical Trigonometry; Analytical Geometry begun, (Bowser); [26]. SURVEYING; [20]. BOTANY: Flowerless Plants; Herborizing; Vegetable Histology (Macloskie's Botany); Bessey's Botany, Briefer Course; (Gray's Manual of Botany); [32]. ENGLISH: Essays.

*Second and Third Terms.*

MATHEMATICS: Analytical Geometry of the plane and of space, (Bowser); [57]. SHADES, SHADOWS, PERSPECTIVE AND SPHERICAL PROJECTIONS (Warren); [21]. ANALYTICAL CHEMISTRY: Qualitative Analysis; [77]. ZOOLOGY; [30]. HISTOLOGY; [7]. ENGLISH: Hunt's Discourse, (Part II); ENGLISH LANGUAGE: Marsh's Lectures on English Language; Marsh's Origin and History of English Language; Lectures on English Language and Style; Essays; [33]. GERMAN: Syntax completed; FRENCH: Syntax completed; Oral and written exercises continued; [57]. ORATORY: Elocution, Declamation, Written Orations.

## JUNIOR YEAR.

*First Term.*

**MATHEMATICS**: Differential and Integral Calculus, (Bower); [65]. **PHYSICS**: Elementary [Mechanics; Properties of Bodies; Mechanics of Fluids; Heat; [53]. **ENGLISH LITERATURE**: Chaucer; Lectures; [26]. **MODERN LANGUAGES**: German: Lessing; French: Racine; [39]. **PSYCHOLOGY**; [26].

*Second and Third Terms.*

*All Courses.*—**PHYSICS**: Electricity and Magnetism; Acoustics; Optics; [57]. **ENGLISH LITERATURE**: Lectures; [38]. **MODERN LANGUAGES**: German: Schiller; Goethe. French: Molière; Corneille; [45]. **PSYCHOLOGY**; [9]. **MINERALOGY**: Descriptive; [27]. **HISTOLOGY**; [12]. **MORPHOLOGY**; [12]. **ORATORY**: Composition and Delivery, Reading.

*Course in General Science.*—**MECHANICS**: Analytical Mechanics of solids and fluids; [76]. **HISTOLOGY**; [14]. **MORPHOLOGY**; [14].

*Course in Chemistry and Mineralogy.*—**ANALYTICAL CHEMISTRY**: Quantitative Analysis; [104].

*Courses in Biology and Chemistry, and Biology and Geology.*—**BIOLOGY**: Vertebrates; [24]. **HISTOLOGY**; [14]. **MORPHOLOGY**; [66].

## SENIOR YEAR.

*First Term.*

*All Courses.*—**ASTRONOMY**: General; [39]. **JURISPRUDENCE AND POLITICAL ECONOMY**; [26]. **MODERN LANGUAGES**: German: Goethe; French: Victor Hugo; Reading scientific prose at sight; [26].

*Course in General Science.*—**ANALYTICAL CHEMISTRY**: Quantitative Analysis; [39]. **PRACTICAL PHYSICS**; [26]. **PRACTICAL ASTRONOMY**;\* [13]. **MATHEMATICAL PHYSICS**;\* [13]. **COMPARATIVE POLITICS**;\* [26]. **ARCHÆOLOGY**;\* [26]. **PHYSIOLOGICAL PSYCHOLOGY**;\* [26]. **STRENGTH OF MATERIALS**;\* [26].

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\* According to the electives chosen.

*Course in Chemistry and Mineralogy.*—ANALYTICAL CHEMISTRY : Quantitative Analysis ; [117].

*Course in Biology and Chemistry.*—ANALYTICAL CHEMISTRY : Quantitative Analysis ; [89]. PALÆONTOLOGY ; [26]. BIOLOGY : [26]. PHYSIOLOGICAL PSYCHOLOGY ; [26].

*Course in Biology and Geology.*—PALÆONTOLOGY ; [89]. BIOLOGY ; [26]. MORPHOLOGY ; [26]. PHYSIOLOGICAL PSYCHOLOGY ; [26].

### *Second and Third Terms.*

*All Courses.*—ASTRONOMY : General ; [9]. GEOLOGY ; [42]. JURISPRUDENCE AND POLITICAL ECONOMY ; [24]. MODERN LANGUAGES : Studies of the first term continued through the second ; [24].

*Course in General Science.*—PRACTICAL PHYSICS ; [34]. PHYSICAL GEOGRAPHY ; [34]. PRACTICAL ASTRONOMY ; \* [17]. MATHEMATICAL PHYSICS ; \* [17]. INTERNATIONAL AND CONSTITUTIONAL LAW ; \* [34]. HISTORY OF ART ; \* [34]. BIOLOGY ; \* [34]. STEREOTOMY ; \* [34].

*Course in Chemistry and Mineralogy.*—ANALYTICAL CHEMISTRY : Quantitative Analysis ; [173].

*Courses in Biology and Chemistry, and Biology and Geology.*—PALÆONTOLOGY ; [39]. BIOLOGY ; [34]. HISTOLOGY ; [34]. MORPHOLOGY ; [67].

## COURSE IN CIVIL ENGINEERING.

This course is designed to fit its graduates for entering the profession of civil engineering. It also provides for the instruction in any of its specialties of the graduates of this College and others who may be found suitably prepared. The course diverges from that in General Science at the beginning, but not to such an extent as to make it difficult to change, if desirable, from one course to the other before the opening of the Sophomore year.

The requirements for entrance to the Freshman Class are the same as in the course for the degree of Bachelor of Science,

except that no examination in Latin is required. The regular course of study occupies four years, and the degree conferred on graduates is that of Civil Engineer (C. E.)

### STATEMENT OF STUDIES.

#### Studies Pursued in Common with the Candidates for B. S.

The instruction in these studies is the same as stated on p. 103, *et seq.*, and under the same instructors. Modern languages (of the Freshman and Sophomore years); English literature; rhetoric; oratory; psychology; mathematics; descriptive geometry; shades, shadows and perspective; free-hand and mechanical drawing; general astronomy; general chemistry; mineralogy (of the Freshman and Sophomore years).

#### Technical Studies.

The instruction in these studies is given by Professors McMillan, Brackett, Young, Rockwood, Willson, Magie, Smith and McNeill.

In many of the technical studies of the course in Civil Engineering the instruction presupposes a thorough preliminary training of the student in mathematics. A thorough mastery of the ordinary divisions of this science is, therefore, indispensable to the successful study of such subjects as mechanics, physics, etc., which follow it.

Great stress is also laid in this course on the study of graphics as a science, both in its general development and in its application to the practice of designers and builders.

**RATIONAL AND APPLIED MECHANICS and the THEORY OF MACHINES.**—The instruction in these subjects covers a wide field of study, beginning with the general discussion of motions and the action of forces, and ending with the deduction of practical formulas relating to the strength or stability of different structures; the power, efficiency and strength of hydraulic, steam and air motors, and to the various problems which arise in the practice of hydraulic engineers.



In dealing with these subjects, rigidly mathematical treatment is generally used, and higher analysis is freely employed wherever it is expedient ; yet proper weight is given to methods of graphic analysis, and the student's attention is especially directed to those problems in which they can be employed with marked advantage.

**EXPERIMENTAL MECHANICS.**—The instruction in this study consists mainly of laboratory work. Its purpose is to familiarize the student with the physical properties of building materials ; to teach him by actual experiment how to conduct tests and to deduce therefrom coefficients of strength, elasticity, etc. ; how to determine coefficients of hydraulic flow and resistance ; and how to gauge, by the aid of indicators and dynamometers, the power of steam and other motors. Under this head come also problems in the erection of structures.

**AN ENGINEERING LABORATORY** has been provided for this work. It contains the following experimental apparatus : — A torsional testing machine ; a wire and cement tester ; various kinds of current meters and water gauges ; a Worthington water meter ; a contrivance for determining the hydraulic slopes within earthen retaining banks ; a flushing tank ; a reaction wheel and other minor pieces of hydraulic apparatus ; a double acting steam pump ; a locomotive link and valve motion and a ten-horse-power compound engine with condenser, indicators, gauges and a Prony brake.

The illustrative apparatus of the laboratory comprises rail sections and joints ; specimens of the products of iron and steel mills and other building materials ; a Sturtevant blower ; models of water-wheels, of trestles and of the details of iron bridge and roof joints, of vaults and arches, and a 25-foot iron model of a single track railroad bridge, with a complete outfit of false-works and other appliances for its erection, designed especially for this College.

**THE PLANNING AND CONSTRUCTION OF ENGINEERING WORKS.**—This is treated in a course of lectures following the study of applied and experimental mechanics. The topics which

receive special attention are given in the list of subjects under the heading "Constructions."

Great stress is laid on the application of correct principles and formulas ; on the careful inspection, manipulation and preservation of materials, and on the economic features of various designs and the modes of executing them.

A large collection of lantern slides has been provided for illustrating this course. Among the more important photographic studies are a large number of views in detail of the East River suspension bridge at different stages of its progress.

An important feature of this part of the course consists of excursions for the examination of rolling mills, bridge works, machine shops, water works, etc. In these visits the class is accompanied by either the Professor or Assistant Professor of the department and every member is required to make full notes of his observations and of the instruction received during the trip.

**PRACTICAL PHYSICS.**—In view of the great importance of the problems of terrestrial magnetism in geodetic surveys, and also in view of the present and increasing demands upon engineers, arising from the application of electricity as a means of illumination and of transmitting energy, provision has been made for the suitable instruction of the student in these subjects, and all candidates for the degree are required to attain a high standard in them.

**GEODESY.** — The study of engineering field work is provided for in the different subdivisions of the course in Geodesy. The structure, adjustment and use of each instrument is made the subject of special attention, and no student is allowed to participate in any extended field operation until he has acquired a certain dexterity in handling the instruments used therein. The instruction in field work, beginning with the measurement of lines and angles, extends through different kinds of surveys in the order of their complexity and ends with problems in higher geodesy.

A special feature of the course is the stress laid on the collection and verification of field notes by each student, and on

their proper use in the preparation of different kinds of plans, maps and charts of surveys. No error is allowed, in field work or in plotting, which is not within the limits observed in current practice.

Under this head is given special instruction in hypsometry, the subject being presented by means of lectures and numerous demonstrations in the lecture room and the field.

A very full collection of instruments has been provided for the course in Geodesy. It represents the work of twelve different firms of high repute, great care having been used to avoid the duplication of instruments by the same maker.

The collection consists of a twelve-inch geodetic transit, a large plane-table with telescopic alidade and a telemeter, engineer's, mining and solar transits, wye and dumpy levels, surveyor's compasses, mercurial and aneroid barometers, sextants, heliotropes, various forms of linear measures, and a large assortment of reconnoitering instruments.

**PRACTICAL ASTRONOMY.**—This is taught in connection with the course in Geodesy, and the students become familiar with the most approved methods of determining time, latitude and longitude, and the true meridian, as well as with astronomical operations in general.

**GEOLOGY.**—This course will occupy two hours a week during the second and third terms of the Junior year, and will be more technical in character than the geological course of the Academic department, though covering nearly the same ground. Dynamical, structural and historical geology will be treated, but special attention will be given to structural geology, including petrography, with reference to its technical and economical bearings.

The text-book employed will be Geikie's Manual of Geology.

**TOPOGRAPHICAL DRAWING.**—The object of this course is to make the student expert in the execution, in pen work and colors, of finished plans and maps of various kinds of surveys. Except in the necessary preliminary drill, the drawings invariably represent actual surveys made by the different classes. A

rigid adherence to the field notes of each survey and a high degree of finish is required in the execution of these drawings.

**GRAPHICS.**—The instruction in graphics includes the following branches :

*Structure Drawing.* A drawing of plan, elevation, end view, sections and details of some railroad bridge, or other structure of approved modern type, to scale, from measurements ; (Sophomore year).

*Machine Construction and Drawing.* A course of lectures, recitations and practical exercises on the kinematics of machinery, with graphical representation of mechanical movements ; theory of link and valve motion ; screw propulsion ; gearing, including the theory and use of Willis and Robinson's odontographs ; working and finished drawings of machinery, etc. Two exercises a week in the first term of Senior year.

Text books and reference works :

Weisbach.... <i>Kinematics and Machinery of Transmission.</i>	Seaton.. <i>Manual of Marine Engineering.</i>
Renleaux..... <i>Kinematics of Machinery.</i>	Unwin ..... <i>Machine Design.</i>
MacCord..... <i>Kinematics of Mechanical Movements.</i>	Goodeve..... <i>Elements of Mechanism.</i>
Auchincloss... <i>Link and Valve Motion.</i>	Forney..... <i>Caterhism of Locomotive.</i>
Stahl and Woods... <i>Elementary Mechanism.</i>	Zeuner ..... <i>Treatise on Valve Gears.</i>
	Sennett..... <i>Marine Steam Engine.</i>
	Warren..... <i>Machine Drawing.</i>

*Stereotomy.* A course on the application of descriptive geometry to stone-cutting, practically applied by the student in cutting a voussoir of plaster to given shape by means of templates, patterns, etc., derived from his own drawings. Text-book, Warren's Stone-Cutting. This course occupies two exercises a week in the second term of Senior year.

**THESIS.**—Every candidate for the degree of Civil Engineer is required to prepare and submit to the approval of the Professor of Civil Engineering, a design for, or a review of some special machine, structure, or process as a graduation thesis.

**SYNOPSIS OF COURSE.****FRESHMAN YEAR.***First Term.*

**MATHEMATICS, ENGLISH, MODERN LANGUAGES, CHEMISTRY, DRAWING, and ORATORY, as in the Bachelor of Science course.**

*Second Term.*

**MATHEMATICS, ENGLISH, MODERN LANGUAGES, CHEMISTRY, DRAWING, and MINERALOGY, as in the Bachelor of Science course.**

*Third Term.*

**MATHEMATICS, ENGLISH, MODERN LANGUAGES, CHEMISTRY, and MINERALOGY, as in the Bachelor of Science course. GEODESY: *The Measurement of Lines*; with common chains and tapes; with city surveyors' chains, tapes and rods; Chain surveys and computation of areas. *The Measurement of Angles*; with different kinds of compasses; Chain and compass surveying, including the simpler methods of determining the true meridian and magnetic declination. Theory and practice; [35].**

**SOPHOMORE YEAR.***First Term.*

**MATHEMATICS, DESCRIPTIVE GEOMETRY, MINERALOGY, ENGLISH, MODERN LANGUAGES, as in the Bachelor of Science course. TOPOGRAPHICAL DRAWING: Drawings representing the conventional symbols separately and in combination; Lettering; The plotting of maps; Map of the farm survey begun; [65].**

*Second Term.*

**MATHEMATICS, ENGLISH, MODERN LANGUAGES, as in the Bachelor of Science course. STEREOTOMY: Structure drawing; [24]. GEODESY: Problems in the partition of lands; Surveys of public lands; Structure and adjustment of engineers' field instruments; [24]. TOPOGRAPHICAL DRAWING: Map of the farm survey finished; Colored topography; [24].**

*Third Term.*

**MATHEMATICS, ENGLISH, MODERN LANGUAGES, and SHADES, SHADOWS, PERSPECTIVE and SPHERICAL PROJECTIONS**, as in the Bachelor of Science course. **GEODESY**: The measurement of angles with transits and theodolites; The computation of lines and angles from the field notes of triangulations; Leveling for bench marks, profiles and cross sections; Topographical surveying. Theory and practice; [28]. **TOPOGRAPHICAL DRAWING**: Contour maps; Drawings of profiles and cross sections; [7]. **STEREOTOMY**: Structure drawing; [7].

**JUNIOR YEAR.***First Term.*

**MATHEMATICS, PHYSICS, ENGLISH, PSYCHOLOGY**, as in the Bachelor of Science course. **GEODESY**: Measurement of heights with barometer and thermometer; Hydrography; Surveying with the stadia and gradienter; Solar compass; Town, plane-table and mine surveying. Theory and practice; [89].

*Second and Third Terms.*

**PHYSICS, ENGLISH, PSYCHOLOGY**, as in the Bachelor of Science course. **MECHANICS**: Analytical mechanics of solids and fluids; [76]. **GEODESY**: Preliminary and location surveys of routes; Staking out for construction. Theory and practice; [80]. **TOPOGRAPHICAL DRAWING**: Hydrographic charts; Town maps; Plans and profiles of mines; Maps of landscape surveys; [52]. **GEOLOGY**; [88].

**SENIOR YEAR.***First Term.*

**ASTRONOMY**: General; [89]. **APPLIED MECHANICS**: Elasticity and strength of materials; [26]. Theory of stresses in roofs and bridges; [78]. **MACHINE CONSTRUCTION and DRAWING**; [26]. **CONSTRUCTIONS**: Roads, railroads, canals and tunnels; [26]. **PRACTICAL ASTRONOMY**, as in elective course of Academic department; [18].

*Second and Third Terms.*

**ASTRONOMY:** General; [9]. **APPLIED MECHANICS:** Stability of walls and arches; Theory of constructions; [48]. **MACHINES:** General theory; Hydraulic motors; Theory of steam and air engines; [30]. **STEREOTOMY:** Stone cutting, theory and plates; [24]. **CONSTRUCTIONS:** Sewerage and drainage; [24]; Water supply; [24]; Materials of structures; Dressing and preservation of materials; Foundations; Details of roofs and bridges; [62]. **PRACTICAL ASTRONOMY,** as in elective course of Academic department; [17]. **PRACTICAL PHYSICS:** Advanced study of terrestrial magnetism and electro-dynamics; [34].

**NOTE.**—It will be noticed that the above list of studies does not provide for regular instruction in the modern languages after the Sophomore year. It is, therefore, necessary to explain that a partial equivalent for such instruction has been provided by the use of French and German books of reference in some of the technical courses of the Junior and Senior years.

## EXAMINATIONS, STANDING AND GRADUATION.

### EXAMINATIONS.

Regular examinations ordinarily take place at the end of a term; each class being examined in the studies of the term. Occasionally when a course of study is finished before the close of a term, the examination takes place when that study is completed; but such examinations are not allowed to interfere with the regular exercises in other studies.

Examinations are for the most part conducted in writing, but in certain subjects are wholly or partly oral. Private examinations are not allowed except in extreme cases, and by special permission of the Faculty. Absence from an examination, except for reasons of absolute necessity, will be regarded as a serious delinquency, and a subsequent examination will not be granted except by a vote of the Faculty.

#### *Regulations Concerning the Removal of Conditions.*

The minimum mark for passing examinations is sixty in every department, the maximum mark being one hundred.

A student whose mark is below fifty in more than two subjects, involving at least forty per cent. of the work of the term, is dropped from his class.

Other students who, during the first or second terms, have been conditioned, shall, if so required by their instructors in the departments in which they have failed, take tutors to be approved by the Faculty, and will have one opportunity for the removal of each condition, not later than the third Saturday of the term succeeding that in which they were conditioned. Of the students who are still found deficient, only those who have shown great industry during the term in which the re-examinations were held, and who, in the opinion of the Faculty, are



able to keep up with their respective classes, may be allowed to continue with the same, the period of probation to be determined by the Faculty in each case. The second examination, held at the end of this period, will be final in its results. Students who have been absent for reasons of absolute necessity from one or more examinations in any term will be examined on or before the second Saturday of the following term. Application for such examination, with reasons for absence, must be made on or before the first Monday of the term.

All conditions standing against a student at the end of the college year must be removed within the week after the opening of the next term. Failing to remove such conditions, the student will be required at once to join the next lower class.

### STANDING.

The results of the term examinations are combined with those of the recitations to decide the relative standing or rank of the student during the term. In computing ranks, each study, elective or required, is estimated relatively to the others according to the number of hours which it occupies in the weekly schedule of lectures and recitations. The conduct of the student and his attendance also affect his standing. The maximum mark in each department is one hundred; the minimum, or passing mark, is sixty. A student whose average, as determined by the combination of his examination and recitation marks, falls below sixty, is conditioned, and in order to continue with his class must be re-examined. A report of the standing of each student is made to his parent or guardian by the Registrar of the College at the close of the first term and at the end of the year. The last report gives the student's standing for the year.

The final rank of a student is calculated from all the marks received by the student during his College course.

### GRADUATION.

Students who have fulfilled the requirements of the undergraduate courses, passing satisfactory examinations in all their

studies and presenting acceptable graduation theses, are ordinarily recommended by the Faculty for the degree attached to the course they have pursued, and if the recommendation is approved by the Trustees they receive diplomas signed by the President and the Clerk of the Board of Trustees.

The graduation thesis must be finished by the second Saturday before Commencement (*i. e.* June 9, 1888), and will be publicly read and defended by the student during Commencement week.

# UNIVERSITY COURSES

## IN THE

### ACADEMIC AND SCIENTIFIC DEPARTMENTS.

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Provision has been made for courses of instruction open to resident graduates of this and other Colleges, under the following regulations :

Every instructor in the College shall be at liberty, with the leave of the Faculty, to give instruction to graduates. He shall meet with his class for at least one hour a week, and not more than three hours a week, during the Academic year, and shall require the members of his class to undergo rigid examinations on the course pursued.

Each graduate student attending instruction regularly, and passing the examinations, is entitled to a certificate stating what he has done, signed by the President in behalf of the College.

Students by pursuing these courses may also qualify themselves for the degrees, Master of Arts, Master of Science, Doctor of Philosophy, Doctor of Literature, or Doctor of Science, according to the regulations prescribed under the headings "Master's Degrees" and "University Degrees."

Each graduate student shall pay ten dollars or such sum as the Faculty may require for every course of instruction that he enters requiring an hour per week, and shall defray whatever expense may be incurred by the use of instruments and materials employed by him. This charge may be remitted in whole or part where the circumstances of the student require it. All undergraduate courses of lectures or instruction are also open to graduate students without the payment of any fees except for material used.

Arrangements for the University courses should be made by application to the individual instructors.

University courses in the following subjects are announced for the present year: Contemporary philosophy, English ethics, Plato and his philosophy, modern philosophy, history, common law, Latin, pedagogics, Oriental archæology, art of the Renaissance, English, Sanskrit, physics, higher mathematics, theoretical astronomy and biology.

Opportunity is also offered to graduates for work in the following subjects, in connection with the regular undergraduate courses: Anglo-Saxon, English literature, psychology, history of philosophy, metaphysics, history of art, geology, mineralogy, biology, physics, practical astronomy, analytical and applied chemistry, assaying, topography.

### UNIVERSITY COURSES.

#### Discussions in Contemporary Philosophy.

This class meets once a week and is conducted by the President, who after every two lectures presides at a discussion. The principal speculative questions of the day, those which raise up doubt and difficulties in young minds, are taken up. No. I of Dr. McCosh's Philosophic Series: On the Criteria of Diverse Kinds of Truth, is used, not so much as a text-book as a guiding thread in the lectures and discussions. He treats of the theories of knowledge, including realism, idealism and agnosticism, and gives the tests of every kind of truth; (1) of first truths: self-evidence, necessity and universality; (2) of reasoned truth: the syllogism, with an explanation of the joint dogmatic and deductive method; (3) of the inductive method, with its canons; (4) of the joint inductive and deductive method. He applies the principles thus derived first to physics, and inquires what is the nature of, and what are the limits to development, and secondly to ethics and religion, inquiring what is the character of our world, optimist, pessimist, meliorist, or what?

#### History of English Ethics.

One lecture a week by Professor Patton during the second term. The lectures in this course will trace the history of eth-

ical thought in Great Britain from Hobbes to Mill. They will be critical and expository, exhibiting the leading features of representative systems, comparing different schools of thought with each other, and showing the relation they sustain to contemporary ethical discussion.

### **Plato and His Philosophy.**

This course, conducted by Professor Orris, is on the writings and philosophy of Plato, as follows: Plato's Republic, alternating with his Theætetus; analysis of his higher dialogues; lectures and dictation on his philosophy and teachings; instruction in the language.

### **Readings in Modern Philosophy.**

Professor Ormond devotes one exercise a week to readings in modern philosophy. Selections are made from the works of Descartes, Locke, Hume, Kant, Hamilton, Spencer, etc. The readings are accompanied by exposition and criticism.

### **History.**

Professor Sloane conducts one exercise a week throughout the first and second terms. Subject: Historical Methods and Historical Systems.

### **English Common Law.**

Professor Johnston gives a course of lectures, one hour a week throughout the second and third terms, on the English common law, using the first and third books of Blackstone's Commentaries on the Laws of England as a text-book. Any edition of Blackstone may be used, but Cooley's is recommended.

### **Latin.**

Professor Packard reads with a graduate class, selections from the following Latin works: Cicero's philosophical writings, Seneca's Moral Epistles, Tertullian and Augustine; or Early Sources of Roman Law.

### **Pedagogics.**

A graduate course is offered by Professor West in pedagogics during second and third terms. It consists of the study of leading educational works and systems and of the theory of education. A thesis is required in addition to the examination at the close.

### **Oriental Archæology.**

Professor Frothingham gives a course on Oriental archæology during the first term. The central idea of the course is a study of the temple at Jerusalem, the subject leading to an investigation of the artistic and other relations of the various nations of Western Asia and Egypt.

### **Art of the Renaissance.**

Professor Marquand conducts a course of reading on the art of the Renaissance in Italy; one exercise a week during the second term.

### **English Language.**

A graduate course will be offered in second term by Professor Hunt. *Beowulf* or *Caedmon* will be the subject.

### **Sanskrit.**

Graduate students may begin Sanskrit with the Senior elective class, or continue studies already begun. For outline of course see p. 70.

### **Physics.**

These courses afford opportunity for advanced work in the laboratory and for the study of theoretical physics. In the laboratory the student is either conducted through courses covering general topics, such as heat, optics, or electricity, which are similar to the courses of the Senior year, but more extended and exhaustive in their character; or, if he so desires, is encouraged to undertake for himself the investigation of special topics. In the theoretical courses the student reads, for a gen-

eral survey of the subject of mathematical physics, some standard text-book such as Jamin and Bouty's *Cours de Physique*, and for the mathematical theory of the particular subject he is working upon, special treatises, such as Fourier's *Analytical Theory of Heat*, Verdet's *Théorie Mécanique de la Chaleur*, Verdet's *Leçons d'Optique Physique*, Mascart and Joubert's *Electricity and Magnetism*, Maxwell's *Electricity and Magnetism*, Kirchhoff's *Mechanik*, etc. Professors Brackett and Magie conduct these courses.

### Higher Mathematics.

The graduate courses this year are in differential equations, in the theory of functions and in higher algebraic curves and surfaces. They are based on the treatises of Forsyth and Boole, Hermite and Clebsch and Gordan, and Salmon and Clebsch, respectively. Professor Fine conducts these courses.

### Astronomy.

This course is conducted by Professors Young and McNeill. It consists of :

(a) *Practical Astronomy*—the same as in the Senior elective, previously described in the course of study of the Academic department. This is open to such graduates as did not take it in their college course.

A more extended course is given to candidates for the degrees of Ph.D. or D.Sc.

(b) *Theoretical Astronomy*—one hour weekly through the year. This course consists in the reading of Watson's *Theoretical Astronomy*, supplemented by selections from Oppolzer and Klinkerfues, and includes the calculation of the orbit of a planet or comet from actual observation.

### Biology.

A thorough advanced course in Biology has been established in connection with the Geological, Zoological, Botanical, and Chemical departments, the objects in view being (1) to foster a spirit of original research, (2) to qualify advanced stu-

dents to become teachers. This course is open to college graduates, also to students presenting diplomas from recognized medical schools.

It is not restricted to students who are candidates for a degree, if they possess sufficient elementary knowledge to profit by the instruction.

The following subjects of instruction are arranged for :

Professor Macloskie—I. Anatomy and embryology of the higher invertebrates. II. Vegetable morphology and histology.

Professor Cornwalli—Physiological chemistry.

Professor Libbey—I. The microscope and microscopic technology. II. Histology. III. Deep sea soundings and dredging ; recent methods and results.

Professor Osborn—I. Comparative anatomy of the vertebrates. II. Elements of embryology.

Professor Scott—I. Vertebrate and invertebrate palæontology. II. Advanced embryology.

These courses are of a comprehensive and elastic character, and according to the requirements and wishes of different students, include much laboratory work under the direction of the instructor. At the close of the first term, the student may select a department of special study for his thesis, which must present the results of original work.

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## MASTER'S DEGREES.

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### MASTER OF ARTS.

The degree of Master of Arts (A. M.) is conferred, three years after graduation, upon any Bachelor of Arts who is pursuing one of the learned professions (including teaching), or who, on or before May 1st of the year in which he seeks the degree, shall have submitted to a committee appointed by the



Board of Trustees, a satisfactory paper, literary, philosophical or scientific.

The same degree may be conferred, two years after graduation, upon any Bachelor of Arts who shall have devoted one of the years exclusively to study in the College under the care of the Faculty, passing rigid examinations upon the studies pursued; or who shall have taken at least one graduate course each year for the two years and passed satisfactory examinations upon his work.

#### MASTER OF SCIENCE.

Bachelors of Science who shall have devoted one year in this College exclusively to the study of such of the following subjects as the Faculty shall prescribe, and who shall have shown satisfactory proficiency therein by dissertations and examinations, may apply for the degree of Master of Science (M. S.). The prescribed subjects are:—Biology, mathematics, rational and applied mechanics, practical astronomy, applied chemistry, qualitative analysis, quantitative analysis, physics, mineralogy, drawing, modern languages.

Any Bachelor of Arts, who after examination may be found to be prepared to pursue a graduate course in science, may become a candidate for the degree of Master of Science on the same conditions as a Bachelors of Science.

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### UNIVERSITY DEGREES IN COURSE.

The following degrees are classed as University Degrees: Doctor of Philosophy (Ph.D.), Doctor of Literature (Litt.D.), Doctor of Philosophy (Ph.D.) in Science, Doctor of Science (D.Sc.), and Bachelor of Divinity (B.D.).

Any person who desires a more complete statement than that given below in regard to the requirements and regulations

concerning any one of the University degrees can obtain the same upon application to the President.

#### GENERAL REGULATIONS CONCERNING DOCTOR'S DEGREES.

Every candidate for one of the above doctorates must be a graduate of some approved college. If he has the degree of Bachelor of Arts he may apply for admission to the courses for any of the doctorates ; but if he has the degree of Bachelor of Science or an equivalent degree, the courses for Ph.D. in Science and D.Sc. only are open to him.

Every applicant shall appear in Princeton on the fourth Wednesday in September to pass a preliminary examination upon certain subjects which are intimately connected with his proposed course of study and which are necessary for its successful prosecution.

The candidate having fulfilled the requirements for admission, must then adopt one of the following plans for his work:

1. He may pursue a course of prescribed study for two years, one year at least of which is to be spent in Princeton in the exclusive study of branches in his chosen department.

2. He may without residence in Princeton pursue a course of study for three years under the direction of a committee of the Faculty appointed for the purpose. This plan does not demand the exclusive employment of the candidate's time in prescribed study for the degree.

At the beginning of the course the candidate shall announce for approval by the Faculty some department as his chief subject of study, and during the first year of his course, he shall also announce for approval by the Faculty two subsidiary subjects.

At an appointed time during the last year of his course the candidate shall present a thesis on some special topic in the department which constitutes his chief subject. This thesis must present evidence of high scholarship and original research.

At the close of his course the candidate must pass a final examination on both his chief and subsidiary subjects of study. He will not be admitted to the examination unless his thesis has been accepted.

In order to meet the expenses of examinations, each person applying for a doctorate shall pay a fee of forty dollars upon first application, twenty dollars each subsequent year of the course, and fifty dollars when the degree is conferred.

If the candidate is pursuing studies in Princeton he shall pay, in addition to the above mentioned sums, the regular fees for such University courses as he may take (see p. 131).

#### BACHELOR OF DIVINITY. (B.D.)

This degree may be conferred upon a Bachelor of Arts of any approved college who shall also have completed a three years' course of theological study in any approved institution, followed by a two years' course of prescribed study in theology. This special course of study shall be prescribed, and all examinations required shall be conducted by examiners designated by the Board of Trustees.

The regulations as to preliminary examinations, chief and subsidiary subjects of study, thesis, and final examination are similar to those pertaining to the doctorates except that only one subsidiary subject is required. Residence in Princeton is not necessary for obtaining the degree.

The fees are the same as those paid by candidates for the Doctor's degrees.

## **FELLOWSHIPS, COMPETITIVE SCHOLARSHIPS AND PRIZES.**

Besides the degrees and honors conferred in the regular course, annual fellowships, competitive scholarships and prizes are offered as special incentives to study, in the classes or departments with which they are connected.

Only matriculated students who are candidates for a degree are admitted to the competition for fellowships, prizes and scholarships, and no one is admitted to such competition who has failed to pass satisfactorily his last preceding examination in any of the departments.

No member of any class is allowed to compete for more than one of the fellowships or scholarships offered to that class.

The names of the fellows, scholars and prizemen of each year are included in the Honor List for the year.

The funds for fellowships, prizes and competitive scholarships are special gifts, and the income is appropriated according to the specific instructions of the donor. They do not belong to the general funds of the College. If, therefore, there be default in the interest on the securities in which these funds are invested, the college assumes no pecuniary responsibility in the matter.

### **FELLOWSHIPS.**

Every competitor must have been a member of the College in full standing for at least two Academic years previous to the fellowship examinations.

No student whose final rank for scholarship is below the third general group can be a competitor for any fellowship ; and no student can be a competitor for the fellowship of any particular department whose average rank for the last two years of his course is below the second group in that department.

Every Fellow obtaining any one of the \$600 fellowships must devote the whole time for one year to study in the department for which the fellowship is provided, under the direction of the Professors in that department. He must reside in Princeton, and pass two rigid examinations on his work, unless by a vote of the Faculty he be allowed to study at an approved foreign university, in which case he shall from time to time furnish written reports of his work to the Professors in his department. The result of every examination and the reports of work done abroad shall be immediately reported to the Faculty. If resident in Princeton, he shall be allowed to occupy free of cost in one of the College buildings a room assigned to him by the College authorities. He shall be regarded, while occupying such place, as a resident officer of the College, and shall perform such duties in preserving order and decorum in the College edifices as the President and Dean shall assign. He shall also, when called on, perform such duties in the department to which he belongs as may be assigned to him by the President at the request of the Professors in that department.

#### THE CHANCELLOR GREEN MENTAL SCIENCE FELLOWSHIP.

This fellowship, originally founded in 1870 upon the annual payment of \$600 by the late Chancellor Henry W. Green, was permanently endowed in 1878 by a gift of \$10,000 by his widow.

The income of this fund, to be paid quarterly, will be awarded to that member of the Senior class who shall write the best essay on Theories of Knowledge, with an examination of Realism, Idealism and Agnosticism (to be given in on or before June 1), and who shall stand highest at a special examination to be held in June, on the following subjects :

A general knowledge of the philosophies of Plato, Aristotle, Descartes, Locke, Leibnitz, Hume, Kant and Hamilton. Cicero *De Officiis*, Book III., *De Contentione Honesti et Utilis*. Theoretical ethics, psychology and metaphysics (McCosh's *Intuitions*, Part I., II., III., Book 1). The syllogism, and induction.

**THE CLASSICAL FELLOWSHIP.**

The Classical Fellowship has been, for a time, without funds. The sum of \$600, payable quarterly, was previously awarded to the successful competitor. A portion of that sum, and possibly the full amount, will be awarded to that member of the Senior class who shall stand highest at a special examination, to be held in June, 1888, on the following subjects :

**IN GREEK.**

Translation from English into Greek. Translation of Prose Greek at sight. The *Alcestis* of Euripides, Aristophanes' *Birds*, Plato's *Charmides* and *Lysis*. The Philosophy of Plato.

**IN LATIN.**

Translation from English into Latin. Translation of Latin at sight. Cicero *De Natura Deorum*, and The Relations of Roman Philosophy to Roman Religion. History of Latin Literature.

**THE CLASS OF 1860 EXPERIMENTAL SCIENCE FELLOWSHIP.**

This fellowship was founded in 1870 upon the sum of \$10,000 subscribed by the Class of 1860. A deficiency of income, resulting from the depreciation of the value of the securities in which the principal was invested and the lowering of the rate of interest, is paid, by the consent of the donor, from the income of the Magee Professorship of Mining and Engineering, founded by George J. Magee, Esq., of the Class of 1860.

The sum of \$600, to be paid quarterly, will be awarded to that member of the Senior class who shall stand highest at a special examination, to be held in June, on the following subjects, viz: 1. The theory of heat. 2. (a) The geology of coal, oil and gas. (b) The history of mammals and birds. 3. Iron and steel.

**THE J. S. K. MATHEMATICAL FELLOWSHIP.**

The J. S. K. Fund was established in 1873 upon the sum of \$11,000, given by a gentleman in New York, \$600 of the income of which is devoted to this fellowship, and \$200 to the Freshman First Honor prize.

This sum of \$600, to be paid quarterly, will be awarded to that member of the Senior class who shall stand highest at a special examination to be held in June, on the following subjects : Analytical geometry ; differential and integral calculus.

#### THE BOUDINOT FELLOWSHIPS.

These fellowships are founded upon a bequest of the late Dr. Elias Boudinot, of New Jersey, and yield each the annual sum of \$250.

**THE HISTORICAL FELLOWSHIP.**—The sum of \$250, to be paid quarterly, will be awarded to that member of the Senior class who shall write the best essay on The Influence of the Theory of the Social Contract on the American Revolution, and pass the best examination in June next on The Embargo System ; its origin and history, and the Federalist opposition to it. The essay to be presented on or before June 1.

The general subject of examination in 1889 will be The War of 1812. The essay will be on The English and American Theories of Citizenship.

The Fellow shall from time to time during the following year, as may be required by the Professor of History, give evidence by written papers that he is pursuing an approved course of historical investigation.

**THE MODERN LANGUAGE FELLOWSHIP.**—The sum of \$250, to be paid quarterly, shall be awarded to that member of the Senior class who shall pass the best examination in June, on the following subjects :

A comprehensive knowledge of the French and the German descriptive grammars. Also, the origin and historical development of these languages. In Literature—The mediæval epics of France and Germany, with the sources of their inspiration. Moreover, their lyrical poetry and its representatives ; the leaders of the classical drama in France in the 17th century ; the current of thought in the 18th century—its exponents and results. A comparative view of Germany's intellectual state before and after the Reformation. Significance of the "Sturm und Drang" period with its chief participants. The current of

thought in Germany from the time of her mental emancipation from foreign influences to the present day. Reading at sight of any given author of the classical or the recent period, An essay of not less than four pages (foolscap) in one of these languages. The examination will be conducted both orally and in writing.

The Fellow shall from time to time during the following year, as may be required by the Professor of Modern Languages, give evidence by written papers that he is reading such a course as the Professor may approve.

#### THE E. M. BIOLOGICAL FELLOWSHIP.

The Biological fellowship will be awarded to that student who shall stand highest at a competitive examination on subjects assigned by the Professors of the Biological department.

The competition for this fellowship will be open to any member of the Senior class in either the Academic or Scientific department, or to any college graduate who shall have pursued during the preceding year, the graduate course in Biology at Princeton, and who shall, in the opinion of the examiners, be deemed competent to pursue the subject advantageously.

This fellowship conveys the use of a table in the National Seaside Laboratory at Wood's Holl, Mass., together with all the facilities afforded for the collection and study of animal life during the season favorable for such investigations. In the winter months following this laboratory work the Fellow will pursue his studies at Princeton, and will be required to prepare and submit a thesis embodying the results of his summer researches.

The examination for this fellowship in 1888 will be held in June upon the following subjects :

1. The structure of the vascular cryptograms and bryophytes.
2. The anatomy and embryology of the crustacea.
3. The structure and development of the vertebrate nervous system. (Huxley's Anatomy of the Vertebrates and Balfour's Comparative Embryology.)
4. The histology of the digestive tract.



**UNIVERSITY FELLOWSHIPS.**

These fellowships were founded by subscription or endowment in the summer of 1887, and were intended by the founders to encourage study and promote original research in the several departments to which they are assigned. They are distinguished from the other fellowships by being open for competition to the graduates of any American college as well as of Princeton, while the appointments are made, not by competitive examination, but by a comparison of the records presented by the applicants as to their previous collegiate standing, capacity, and character. The regulations for the appointment and the duties of the University Fellows have not as yet been fully determined upon. This announcement is therefore only preliminary and fuller information may be obtained on or after January 1st, 1888, by application to the President.

At present the fellowships are three in number, but they will probably be increased to five or more during the year. Those thus far founded are as follows :

**THE SOUTH EAST CLUB UNIVERSITY FELLOWSHIP IN  
SOCIAL SCIENCE.**

This fellowship pays to the holder \$500 per annum.

**THE CLASS OF 1877 UNIVERSITY FELLOWSHIP IN BIOLOGY.**

This fellowship pays to the holder \$400 per annum.

**THE UNIVERSITY FELLOWSHIP IN ENGLISH.**

This fellowship pays to the holder \$400 per annum.

**PRIZES AND COMPETITIVE SCHOLARSHIPS.**

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**ALEXANDER GUTHRIE McCOSH PRIZE.**

The interest of \$1,000 will be given to that member of the graduating class who shall be adjudged by the Professors of Mental and Moral Science to have written the best thesis on Mental Philosophy, giving evidence of scholarship or original

research. The essay is to be given in to the President of the College within one year after the writer of it graduates ; that is, for the present year, on or before June 12, 1888.

#### THE LYNDE PRIZES.

Three prizes—the income of \$5,000, contributed by Charles R. Lynde, Esq.—will be awarded by a committee appointed by the Faculty, to the three successful competitors in a debate on the Tuesday evening preceding Commencement. The competitors are six members of the Senior class—representatives of the Literary Societies—selected by committees appointed by the societies respectively, from their own members in the Faculty.

#### THE BAIRD PRIZES.

Through the liberality of Charles O. Baird, Esq., the following prizes, representing the income of \$6,000, will be given to those who excel in the oratorical exercises of the Senior class, viz.: The Baird prize of \$100, to the best speaker of those who have ranked among the first six writers in any two of the three departments of English Literature, Rhetoric and Oratory ; a prize for oratory, of \$50, to the best speaker exclusive of the Baird Prizeman, of those who, in the same departments, have ranked among the first twelve writers ; a prize for delivery, of \$30, to the best speaker exclusive of the two just mentioned ; also, a prize for poetry, of \$50 ; and two prizes of \$40 and \$30, respectively, for the best and the second best written disputations.

#### THE CLASS OF 1859 PRIZE.

The interest of \$2,000, given by the Class of 1859, will be awarded to that member of the Senior class who shall write the best essay on Swinburne, as a Poet and Critic, and pass the best examination on Shakespeare's *Troilus and Cressida*. The essay must be handed in on or before June 1, and the examination will be held in June.

The subject of the essay for the Class of 1889 will be Dr. Samuel Johnson.

**THE GEORGE POTTS BIBLE PRIZES.**

The yearly interest of \$1,000, given in 1867 by Mrs. Sarah A. Brown, expended in the purchase of two copies of Matthew Henry's Commentary on the Bible, will be presented to the two best Biblical scholars of the Senior class at the end of their College course.

**THE LYMAN H. ATWATER PRIZE IN POLITICAL SCIENCE.**

This prize, being the annual interest on the sum of \$1,000, contributed by the Class of 1883, was instituted as a memorial of Rev. Lyman H. Atwater, D.D., LL.D., Professor of Political Science. It will be given to that member of the Senior class who shall be adjudged by the Professors of Political and Social Science to have passed the best examination and written the best essay. The subject for the examination in 1888 will be The Bi-cameral System in the English Parliament and the American Congress. The subject for the essay will be The Veto-Power of the President. The essay must be ready June 1, 1888; the date of the examination will be announced at that time.

**PRIZE IN ARCHITECTURE.**

Mrs. Norman White has established in memory of her son Frederick Barnard White of the class of 1883 a prize in architecture yielding \$50 each year. It is open to the entire Senior class and will be given for the best essay and oral examination. The subject of the essay for this year is The Origin of the Gothic Style. The subject of the examination will be the History of Gothic Architecture. The essay should be presented before May 15, 1888.

**THE WOOD SCHOLARSHIP.**

The sum of \$150, the income of a legacy of Dr. George B. Wood, will be awarded to that member of the Junior class who shall stand highest for the Junior year.

**JUNIOR ORATOR MEDALS.**

Four gold medals, or books of equal value, will be awarded by a committee appointed by the Board of Trustees, to the four

successful competitors in an oratorical contest on the Monday evening before Commencement. The competitors are eight members of the Junior class—four from the Cliosophic and four from the American Whig Societies—selected by committees appointed by the societies respectively, from their own members in the Faculty.

#### THE MACLEAN PRIZE.

The Maclean prize, founded by the will of the late Henry A. Stinnecke, consisting of the sum of \$100, will be given to that one of the orators chosen by the Literary Societies from the Junior class, who shall on the Monday evening before Commencement pronounce the best English oration.

The committee of judges will be composed of the Professor of Rhetoric and two graduates of the College appointed by the Board of Trustees.

#### DICKINSON PRIZE.

The Dickinson prize, founded by John Dickinson, Esq., of New Jersey, in 1782, consisting of a medal of the value of \$60 (or its equivalent in money), will be awarded to that member of the Junior class who shall write the best dissertation upon The Methods of Discovering Truth in the various Sciences. The dissertation to be presented on or before October 15, 1888.

#### CLASS OF 1876 MEMORIAL PRIZE FOR DEBATE IN POLITICAL SCIENCE.

This prize is to be given annually by the Class of 1876 to the successful contestant in a debate on a subject of current interest in American politics, to be held on Washington's Birthday, said prize to be the interest on \$1,000. The competitors, four in number, one from each class, are to be chosen by a vote of the respective classes.

#### THE STINNECKE SCHOLARSHIP.

The Stinnecke Foundation was established in 1870 by the will of the late Henry A. Stinnecke, of the Class of 1860, and was supplemented by a bequest received in 1876 from his aunt, Miss Maria Stinnecke. The income is divided between the Stinnecke scholarship of \$500 and the Maclean prize of \$100.

The Stinnecke scholarship, of the annual value of \$500, tenable during the College course, unless forfeited by neglect of study, "will be given to that person who, having entered the Sophomore class, shall pass the best examination at the opening of the session in September, 1890, in the Odes of Horace, the Eclogues of Virgil, and the Latin Grammar and Prosody, as well as the Anabasis or Cyropædia of Xenophon and the Greek Grammar." Students of the College who have been members of the Freshman class, as well as new students entering the Sophomore class, will be admitted to such examination. The committee of examiners is appointed by the Board of Trustees.

#### THE CLASS OF 1861 PRIZE.

The interest of \$1,200, given by the Class of 1861, will be awarded to that member of the Sophomore class who shall pass the best examination in June next on those portions of the mathematical course of the Sophomore year which shall be especially designated by the Professor of Mathematics.

#### THE FRANCIS BIDDLE SOPHOMORE ESSAY PRIZE.

This prize, the yearly interest of \$500, will be given to that member of the Sophomore class, not below the fourth group in his English studies, who, in the judgment of a committee appointed by the Faculty, shall write the best English essay of the year.

#### THE FRESHMAN FIRST HONOR PRIZE.

A prize of \$200, part of the income of the J. S. K. Fund, to be paid in quarterly installments during the following year, will be awarded to that member of the Freshman class who, having entered said class at the beginning of the College year, shall, at the end of the year, be reported to the Trustees by the Faculty as having attained the "highest average grade" in scholarship, provided he pursue his studies in this College and maintain a good standing during the Sophomore year. No student who has been suspended from College, or who has been put upon his last probation, shall be eligible to this prize.

## **SOCIETIES.**

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### **LITERARY SOCIETIES.**

The Philosophic and American Whig Societies originated early in the history of the College. They are conducted by the undergraduates, but also include in their organization graduates and officers of the College. Both possess halls containing the rooms for meeting, reading rooms and valuable libraries of over 8,000 volumes each. They both pursue courses of literary exercises, award numerous prizes for orations, essays and debates and grant diplomas to their respective graduates.

A generous competition for College honors has always prevailed between them. On the evening before Commencement representatives of the societies from the Senior class engage in a public debate—on the preceding evening representatives from the Junior class engage in a competition in oratory. The details respecting the Lynde debate and the Junior orations will be found on pp. 146, 147.

These societies are considered a part of the educational appliances of the College, and students are advised to join them.

### **THE ENGINEERING SOCIETY.**

This is an organization conducted by the undergraduates of the Engineering Course, although its membership includes students in other departments of the College, and graduates.

Meetings are held weekly in the reading room of the society in University Hall, and the exercises are of a literary, scientific and technical character.

### **THE PHILADELPHIAN SOCIETY.**

This is a society composed of undergraduates, united by a covenant of mutual religious faith and sympathy. It was founded in the year 1825, and has always been an active and successful agency in promoting the religious life of the College. Devotional meetings are held on Thursday and Saturday evenings, under its direction, usually conducted by members of the Faculty. Murray Hall, the building belonging to the society, was erected from a bequest left for the purpose by Hamilton Murray of the

class of 1872. It contains, besides the room for worship, a reading room supplied with religious books and periodicals.

#### THE ST. PAUL'S SOCIETY.

The St. Paul's Society is an association similar in nature and aim to the Philadelphian, and is intended to be helpful, devotionally and practically, to those students in the College who have been accustomed to the worship of the Protestant Episcopal Church. It has weekly meetings, conducted by the students, and ordinarily a course of sermons is delivered annually in Trinity Church under its auspices.

#### BUILDINGS.

The buildings are situated in a campus of about fifty-five acres and are grouped around Nassau Hall, which dates back nearly to the foundation of the College, having been erected in 1756. One wing of this building is still occupied by students. The central and eastern portions contain the geological museums and lecture room. The School of Science building, the Chancellor Green Library, Dickinson Hall, Murray Hall and several of the dormitories have been erected within the last seventeen years. The Marquand Chapel, the gift of H. G. Marquand, Esq., of New York, was built in 1882. The academic lectures and recitations are conducted mainly in Dickinson Hall, while the scientific lecture rooms and laboratories are principally in the building of the John C. Green School of Science. The students—except by special permission of the Faculty—reside in the College dormitories—the west wing of Nassau Hall, East College, West College, Reunion Hall, Witherspoon Hall, Edwards Hall and University Hall.

#### THE CHANCELLOR GREEN LIBRARY.

The College library began with the College itself, in a bequest of books by Governor Belcher. The first catalogue, printed in 1760, shows that it then consisted of more than twelve

hundred volumes. It suffered much during the Revolution and it was burnt, with Nassau Hall, in 1802. The gifts of many liberal friends soon re-established it, and it slowly advanced to 9318 volumes in 1854. The want of resources for its increase kept it small, until the Elizabeth fund of \$50,000 was created by Mr. John C. Green in 1868. When the present library building was erected by him, in 1872-73, the collection contained about 25,000 volumes. Since that time its progress has been rapid, and it now consists of more than 65,000 volumes. The liberality of those who represent his estate has permitted an average yearly increase of 5,000 volumes.

The library is probably strongest in the departments of mathematical, physical, natural and mental science, but it is rich, also, in philology and literature. Few libraries surpass it in respect to works on the origin and early history of our language and our race. Generous efforts have been made to enrich it with the serial issues of scientific associations abroad. A collection of books on fine arts may be seen in a separate room. The income of the Library Fund, appropriated to the departments by a committee of the Faculty, is to be expended under the direction of the Professors of the respective departments.

The arrangement of books upon the shelves is by topics, and is fully exhibited in the library catalogue, of which two copies lie on each of four tables near the desk. A manuscript appendix, constantly increasing, is accessible on application at the desk. The analysis of scientific periodicals is continually proceeding, forming a sort of "Poole's Index" for science, and the manuscript results, kept at the desk, are accessible to every Professor. Books serving to illustrate topics named by Professors for essays required from the students are temporarily withdrawn from circulation and kept by themselves to be read in the library; but such books may be borrowed for a night. A large collection of books of reference is kept constantly on the shelves, consisting of twenty encyclopædias, seventy periodicals and the dictionaries of twenty languages. A bulletin containing the titles of books bought during the preceding year, is printed early in every fall term, kept on the library tables, and given to every applicant.



At the west end of the building is a reading-room for the Faculty, furnished with more than fifty periodicals of high character. Students are admitted on application at the desk, and they may borrow the past issues of each periodical when a new number has reached the table.

#### *Library Hours.*

The Library is open every secular day; for the delivery and exchange of books from 10 A. M. to 1 P. M., and from 2 to 4 P. M.; for the consultation of books from 10 A. M. to 1 P. M., and from 2 to 5 P. M. In midwinter the want of light shortens the library day one-half hour at the end. The use of books is allowed, under the rules, to all the students. Resident graduates have the same privileges in the library as undergraduates.

#### SEMINARY LIBRARY.

The library of the Princeton Theological Seminary, which contains 48,000 volumes, is open to students of the College for consultation and loan of books on every secular day from 10 A. M. to 1 P. M.

### MUSEUMS.

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#### **The E. M. Museum of Geology and Archæology.**

This Museum, occupying the central and eastern wings of Nassau Hall, contains collections which are distributed in the three general departments of Geology (including Mineralogy), Palæontology and Archæology. Their arrangement is especially adapted to the purposes of comparative study.

In the GEOLOGICAL DEPARTMENT a special room contains a unique collection of over 5,000 specimens of erratic boulders and drift materials from Switzerland. There is also a special room devoted to the typical rocks and fossils of the State of New Jersey. A collection of the typical rocks of the State of New York represents the series as described in the Geological Survey of that State.

There is in this department a large collection of minerals, containing about 2,600 specimens, bequeathed to the College by the late Archibald MacMartin, of New York. The perfection of the specimens, and the number of localities represented in each family, make this collection one of especial value.

The collections of the PALÆONTOLOGICAL DEPARTMENT fill two large halls, with extensive galleries. The central hall, or Synoptic Room, is especially designed and arranged with reference to the general course in geology. There are mounted casts of the gigantic reptiles and mammals of the secondary, tertiary and quaternary ages. Around these the characteristic fossils of each of the great ages of life form as many groups, which follow each other in chronological order, while within each group the fossils are arranged according to their zoological affinities. The typical fossils selected agree, as far as possible, with those mentioned in Dana's Geology, as characteristic of different geological periods.

The upper or eastern hall contains the main collections for advanced students ; on the platform are the skeletons of a mastodon, an Irish deer, a cave bear, and some of the extinct birds of New Zealand ; also the skulls of *Uintatherium* and *Loxolophodon*, and a remarkably complete skeleton of *Cervalces*. Surrounding the room is a very perfect collection of vertebrate and invertebrate fossils from Europe and America, illustrating the vertebrate and invertebrate forms of all the geological epochs. Included in this series are the fine Eocene and Miocene fossils, procured in the West by the various Princeton collecting parties. There is also a series of fossil insects and plants from Colorado. Altogether the number of fossils, not counting duplicates, is 9,000.

ARCHÆOLOGICAL DEPARTMENT.—Here are relics of the Swiss lake dwellings, and numerous implements of stone and bronze from Denmark ; also several hundred flint instruments from most of the classical localities of the palæolithic and neolithic ages of France.

America is represented in the pottery and human remains of the mound builders, by several hundred specimens of Mexican

and Peruvian pottery, and by a number of recent Indian relics. The interesting ethnological collection of objects, chiefly from Alaska and New Mexico, which Dr. Sheldon Jackson presented to the Theological Seminary of Princeton, has been transferred to this Museum by the trustees of that institution, with the consent of the donor. The Archæological Gallery contains also a series of models of the cliff-ruins of the Southwest, executed under the direction of Dr. Hayden.

Below the eastern hall are the lecture and working rooms.

### Biological Collections.

The biological collections have been chiefly made from the endowment fund of the John C. Green School of Science. There have also been many smaller donations to the Museum from time to time. The collections are placed in the large upper hall of the School of Science building, and are at present especially rich in osteological specimens. On the same floor are the laboratory and working rooms of the Curator of the Museum. The collection of vertebrates includes a large number of mounted and disarticulated skeletons of the mammals, reptiles, birds and fishes, series of the birds of New Jersey and of other districts of North America, carefully mounted, and alcoholic specimens. A feature of the ornithological collection is the very large number of unmounted bird skins, arranged for the purpose of comparative study of the plumage, beak and feet. Among the invertebrates are a series of ascidians, echinoderms, molluscs, crustaceans, insects, worms, corals, sponges, and microscopic preparations of small forms. The whole collection has also been catalogued and numbered. Students may apply to the Assistant Curator for access to the catalogue and cases containing the skeletons.

The Herbarium is on the second floor of the School of Science building, and is arranged as a museum of the botanical collections, also as a working laboratory for students. The plants are classified according to Bentham and Hooker's *Genera Plantarum*, and include specimens from the different sections of the United States, and from Europe and Australia. There are

extra specimens for laboratory use, and dissecting and compound microscopes, anatomical instruments, section cutters, models, diagrams and books of reference.

During the last year the collections have been increased by the purchase of skeletons of the wapiti, buffalo, dendrohyrax, by specimens of *lozosoma*, *balanoglossus*, *tomopteris*, *carinaria* and other invertebrates. Thank are due to Mr. Frank du Pont Marston for the present of a mounted specimen of the loon (*Colymbus torquatus*) in summer plumage; also to Mr. Charles Earle for presents of echinoderms and corals from the Bermudas.

The zoological charts of Leuckhart and Nitsche, and Kny's botanical charts have been purchased; also two of Zeiss's microscopes and a set of his new apochromatic objectives.

### **The Museum of Historic Art.**

The plans for the new Museum of Historic Art have been completed and the erection of the central portion of the building has been begun. The building is to be fire-proof throughout. It will contain the lecture rooms of the School of Art, and also galleries for the reception of casts and collections. When completed it will receive the valuable Trumbull-Prime collection of pottery and porcelain, as well as several collections of antiquities which have already been given by friends of the College. It is hoped that the Museum may become the receptacle of various objects of art contributed by those who are interested in the advancement of the study of art in the College.

## **LABORATORIES AND APPARATUS.**

### **Physical Laboratory and Apparatus.**

The physical laboratory is fitted up with tables and other arrangements to accommodate about twenty students at once. Besides the appliances usually employed in lecture demonstrations, the cabinet of apparatus contains all the instruments of precision required in the experimental courses.

The following deserve especial mention :—A fine balance, by Becker, sensitive to one milligramme under a load of twenty

kilogrammes. A cathetometer (Grunow), with scale of one metre. A dividing engine and comparator (Rogers). A cylinder chronograph, for all time observations in the laboratory, in electrical communication with the standard clock of the astronomical observatory. A diapason chronograph (Koenig), for minute intervals of time. Pendulum apparatus, of both Borda's and Kater's forms. A spectrometer (Fauth) with 18-inch circle reading by microscope to single seconds. Ditto (Grunow), with smaller circle, reading to 10''. Ditto (Stackpole), reading to 30''. A number of diffraction gratings (Rutherford and Rowland), ruled upon glass and speculum metal; to be used with these spectrometers. A large spectroscope, with dispersive power of twelve prisms (Browning). Sir William Thomson's absolute electrometer and quadrant electrometer (White). Lippmann's capillary electrometer. A set of accurate resistance coils, and standard condenser (Elliot). A large number of galvanometers suited to the different requirements of the laboratory. Sets of standard thermometers; apparatus for calorimetric inquiries; photometers, etc.

### Chemical Laboratories.

The laboratory and cabinets of the department of General Chemistry are fully equipped for the illustration of the courses in the two branches of general and applied chemistry.

There is a large laboratory for the department of Analytical Chemistry, and connected with this are the Professor's and Assistant's rooms, acid room, weighing room and store room, provided with the best appliances. There is also an assay laboratory, with crucible and muffle furnaces. These laboratories are all in the School of Science building, and each student has a desk for his own use, with cupboards and drawers in which he can lock up such apparatus as is supplied to him individually.

### Mineralogical Laboratory and Collection of the School of Science.

The laboratory contains desk-room for fifty students. Each desk is fitted with gas connections for blowpipe work in deter-

minative mineralogy, and contains a locked drawer for the student's apparatus.

There are three cabinets of minerals. The principal one contains over five thousand specimens, embracing nearly every mineral species. Two smaller cabinets, one with labeled and the other with unlabeled minerals, are provided for practice with the classes, and to these two cabinets the students have free access.

There is also a collection of 240 specimens of typical rocks; together with a large number of Fuess' rock sections, as well as sections from other sources, for the study of lithology.

The laboratory is provided also with section cutters, grinding lathes, and other appliances for the special study of minerals and rocks; including a complete Groth's polarizing apparatus with goniometer, a large Babinet goniometer, Norremberg's polarizing apparatus, Rosenbusch's microscope, and minor apparatus.

### Histological Laboratory.

This laboratory is situated on the upper floor of the west wing of Nassau Hall. It is fitted to accommodate twenty-two students at a time, each of whom is provided with the requisite instruments, reagents and staining fluids for the study of the various tissues. The microscopes have been selected with a view to convenience in practical work. A large private collection of slides, illustrating the general subject of histology, is also placed at the disposal of the students, as well as books of reference and American and foreign publications. The laboratory is open at all hours to its regular students.

### The Class of 1877 Biological Laboratory.

This building is now in course of erection and will be completed early in 1888. It was presented to the College by the Alumni of the Class of 1877 at their decennial reunion. It is designed for the advanced practical and experimental courses in anatomy, embryology, and physiological psychology. The main morphological laboratory, upon the second floor, will be equip-

ped for the instruction of undergraduate students, with a private room adjoining for the instructors in charge. The first floor comprises the embryological laboratory, intended for the use of University students engaged in research, and is in charge of the Class of 1877 Fellow in Biology; also the physiological laboratory for instruction and experimental work in physiological psychology; also the laboratory library. The basement is designed for aquaria. The laboratory will be open to students during the day and in the evening subject to special regulation.

Until the new laboratory is completed work is carried on in the old morphological laboratory.

## **ASTRONOMICAL OBSERVATORIES.**

### **The Halsted Observatory.**

This is appropriated to scientific work, chiefly in the department of astronomical physics. The building is of stone, with an iron dome, 39 feet in diameter. The power for moving the dome and its sliding shutter is furnished by a gas engine. The principal instrument is the great equatorial of 23 inches aperture and 80 feet focal length, made by the Clarks of Cambridge. It is provided with all the usual micrometers, spectroscopes and other accessories on a scale proportional to the instrument. The building contains also two clocks and a chronograph.

### **The Observatory of Instruction.**

This establishment is devoted entirely to the use of students, and is fully equipped for its purpose. It possesses an equatorial (by Clark) of  $9\frac{1}{2}$  inches aperture, with a full complement of spectroscopic and other accessories. It has also a 9-inch reflector; a meridian circle with telescope 4 inches in diameter; two transit instruments with 3-inch telescopes, both of them arranged for use as zenith telescopes; a 3-inch prime-vertical instrument; a chronograph; two standard clocks, and two chronometers. There are also a number of sextants, and all the other subsidiary apparatus required for carrying out the work detailed on page 78.

## GYMNASIUM.

The gymnasium was built in 1869 by Mr. Robert Bonner and Mr. Henry G. Marquand. It is thoroughly equipped with all the apparatus necessary for a complete physical training. It has hot and cold shower and plunge baths, dressing rooms, bowling alleys, and besides the main hall, a room for base ball practice. There is also a gallery for visitors. The gymnasium is open from 7 to 8 A. M., 12 M. to 1.30 P. M., 5 to 6.30 P. M., on every day except Saturday, when it is open from 12 M. to 6.30 P. M. During the second term exercise in the gymnasium is required of all members of the Sophomore and Freshman classes, three times a week; the remainder of the year attendance is optional. Classes in the use of Indian clubs and calisthenics are held every day during the noon and afternoon hours. These exercises are adapted to all grades of strength, and are such as to maintain and improve in health all who take part in them, health being the primary and strength the secondary object of exercise. Special exercise on the various apparatus is under the personal supervision of the Superintendent, who is also at the command of any student for advice in regard to physical development and the laws of health. During the fall term there is an outdoor athletic meeting for prizes; in the spring term a gymnastic contest also for prizes, and at Commencement a gymnastic exhibition.



## GENERAL COLLEGE ORDERS.

### TERMS AND VACATIONS.

The year is divided into two terms of fourteen weeks each and one of nine weeks.

The first term of the present College year (1897-8), began on Wednesday the 14th of September, 1887, and ends on Wednesday, the 21st of December. The second term begins on Wednesday, the 4th of January, 1888, and ends on Wednesday, the 11th of April. The third term begins on Wednesday, the 18th of April, and ends on Wednesday, the 20th of June, 1888—the day of the Annual Commencement.

Students are required to return to College on the first day of each term, and absences from any College exercise at the beginning of a term count double.

Students are not allowed to leave College during term-time without express permission obtained from the Faculty or from the officer of the class to which they belong.

### COMMENCEMENT ANNIVERSARIES.

THE ANNUAL COMMENCEMENT takes place on Wednesday preceding the last Wednesday in June.

THE BACCALAUREATE SERMON of the President to the graduating class is delivered in the College chapel on the Sunday preceding Commencement.

The Class Day exercises of the graduating class and the Junior oratorical contest are held on Monday preceding Commencement. The reading of theses by the graduating class of the School of Science, the annual meetings of the Literary Societies, the annual meeting of the Alumni Association of Nassau Hall, and the Lynde prize debate are held on Tuesday.

### PUBLIC WORSHIP.

Prayers are offered in the Marquand chapel every week-day morning. In these services members of the Faculty officiate in turn.

Divine service, under the superintendence of the President, is held in the Marquand chapel, on Sunday, at 11 o'clock, A. M.

The service is conducted, alternately, by the Dean and some one of the clerical members of the Faculty.

Religious services are held in the chapel every Sunday afternoon at 5 o'clock.

Permission to attend divine service elsewhere than in the chapel, on special occasions, is granted on application to the President. For permission to attend regularly one of the churches of the town on Sunday morning, a written request from the parent or guardian of the applicant must be presented to the President.

### RELIGIOUS INSTRUCTION.

Biblical instruction is given during the week, as follows :

To the Senior class by Dr. Murray : The development of doctrine in the New Testament.

To the Junior class by Professor Ormond : The Book of Acts.

To the Sophomore Academic class by Professor Orris : St. John's Gospel in Greek ; by Professor Winans : St. Luke's Gospel.

To the Freshman Academic class by Professors Hunt and West and Mr. Roddy : General introduction to the study of the Scriptures, the poetical Books of the Old Testament and the parables of our Lord.

To the Freshman and Sophomore classes in the School of Science by Professor Macloskie : Typology of the Old Testament and the life of Christ.

### ATTENDANCE UPON COLLEGE EXERCISES.

The several classes ordinarily attend three recitations or lectures every day, except Saturday, when there are but two College exercises.

Every undergraduate student is required to attend all College exercises in the chapel, to be present during the lectures and recitations of his class, and is expected to avail himself of the privileges of the library and gymnasium upon the conditions and at the hours appointed.

Each student is allowed a certain limited number of absences from chapel and recitations during the term. When a student's absences exceed this gratuity they are charged against his gratuity for the next term, or otherwise dealt with by such discipline as the Faculty may direct.

### CHARITABLE FUNDS.

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**THE RICHARDS FUND.** A bequest of Mrs. Esther Richards, of New York, amounting to \$2,970.32, for the benefit of candidates for the ministry. Received in 1790.

**THE LESLIE FUND.** A bequest of James Leslie, of New York, a graduate of the Class of 1759, amounting to \$10,677.49, for "the education of poor and pious youth with a view to the ministry of the Gospel in the Presbyterian Church." Received in 1792.

**THE HODGE FUND.** A bequest of Hugh Hodge, of Philadelphia, of a house and lot on Market street, above Second (No. 205), "to be held by the Trustees in trust, to lease out from time to time, and the rents to be applied to the support and education of pious youth for the ministry." Received in 1805. The net income for the current year will amount to about \$750.

**THE VANARSDALE FUND.** A bequest of Robert VanArsdale, of Newark, N. J., of the Class of 1826, amounting to \$8,000, "in trust for promoting charitable instruction in the College of New Jersey, according to the discretion of the Faculty." Received in 1875.

### ENDOWED SCHOLARSHIPS.

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| 1-3. The COLT Scholarships,<br>founded by Roswell Colt, of Paterson, N. J.,                            | \$3000 |
| 4. The NEWKIRK Scholarship,<br>founded by Matthew Newkirk, of Philadelphia,                            | 1000   |
| 5. The JOHN JOSEPH RANKIN Memorial Scholarship,<br>founded by his father Wm. Rankin, of Newark, N. J., | 1000   |
| 6. The CRESSWELL Scholarship,<br>founded by A. Cresswell, of Kishacoquillas, Pa.,                      | 1000   |

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|--------|---|------|
| 7.     | The ISAAC R. RANKIN Scholarship;<br>founded by Isaac R. Rankin, of Newark, N. J.,                         | 1000 |
| 8.     | The MUSGRAVE Scholarship,<br>founded by Rev. George W. Musgrave, D.D.,                                    | 1000 |
| 9.     | The COGSWELL Scholarship,<br>founded by Rev. Jonathan Cogswell, D.D.,                                     | 1000 |
| 10.    | The GREEN Scholarship,<br>founded by Hon. Henry W. Green, LL.D.,  | 1000 |
| 11-15. | The LENOX Scholarships,<br>founded by James Lenox, of New York,   | 5000 |
| 16.    | The HODGE Scholarship,<br>founded by Dr. Hugh L. Hodge, of Philadelphia,                                  | 1000 |
| 17.    | The A. B. BAYLISS Scholarship,<br>founded by A. B. Bayliss, of Brooklyn,                                  | 1000 |
| 18.    | The HENRY J. VAN DYKE Scholarship,<br>founded by George L. Sampson, of Brooklyn,                          | 1000 |
| 19.    | The GREGORY Scholarship,<br>founded by Dudley S. Gregory, of Jersey City,                                 | 1000 |
| 20.    | The FIRST PRESBYTERIAN CHURCH OF PEEKSKILL<br>Scholarship, founded by members of the Church,              | 1000 |
| 21.    | The VAN VORST Scholarship,<br>founded by Hon. John Van Vorst, of Jersey City,                             | 1000 |
| 22.    | The JANEWAY Scholarship,<br>founded by the Rev. Jacob J. Janeway, D.D.,                                   | 1000 |
| 23.    | The PRESBYTERIAN CHURCH OF HUNTINGTON, L. I.,<br>Scholarship, founded by the ladies of the Church,        | 1000 |
| 24.    | The BACKUS Scholarship,<br>founded by E. F. Backus, of Philadelphia,                                      | 1000 |
| 25.    | The VAN SINDEREN Memorial Scholarship,<br>founded by Mrs. and Miss Van Sinderen, of Brooklyn,             | 1000 |
| 26.    | The NORRIS HALSTED Scholarship,<br>founded by Gen. N. Norris Halsted, of Newark, N. J.,                   | 1000 |
| 27.    | The MACLEAN Scholarship,<br>founded by Drs. John and George M. Maclean,                                   | 1000 |
| 28.    | The HAINES Scholarship,<br>founded by Richard T. Haines, of Elizabeth, N. J.,                             | 1000 |
| 29.    | The JACKSON Scholarship,<br>founded by the Hon. John P. Jackson, of Newark, N. J.,                        | 1000 |
| 30.    | The TUTTLE Scholarship,<br>founded by Joseph N. Tuttle, of Newark, N. J.,                                 | 1000 |
| 31.    | The GERTRUDE N. WOODHULL Memorial Scholarship,<br>founded by her son, Dr. John N. Woodhull, of Princeton, | 1000 |
| 32.    | The NATHANIEL W. TOWNSEND Memorial Scholarship,<br>founded by his daughter, Mrs. Daniel Haines,           | 1000 |
| 33.    | The FIRST PRESBYTERIAN CHURCH OF BRIDGETON<br>Scholarship, founded by members of the Church,              | 1000 |

34. The SKIDMORE Scholarship,  
founded by Joseph P. Skidmore, of New York, 1000
35. The SPENCER Scholarship,  
founded by L. S. Spencer, 1000
36. The JEREMIAH D. LALOR Memorial Scholarship,  
founded by a friend, 1000
37. The MARQUAND Scholarship,  
founded by Frederick Marquand, of Southport, Conn., 1000
38. The FIRST PRESBYTERIAN CHURCH OF TRENTON  
Scholarship, founded by members of the Church, 1000
39. The CAMERON Scholarship,  
founded by the Hons. Simon and Donald Cameron, 1000
40. The SECOND PRESBYTERIAN CHURCH OF ELIZABETH  
Scholarship, founded by members of the Church, 1000
41. The C. S. BAYLISS Scholarship,  
founded by Charles S. Bayliss, of Brooklyn, 1000
42. The ELIZA MUSGRAVE GIGER Memorial Scholarship,  
founded by her son, Prof. George M. Giger, D.D., 1000
43. The BLAIR Scholarship,  
founded by James Blair, of Scranton, Pa., 1000
44. The PENNINGTON Scholarship,  
founded by Dr. Samuel H. Pennington, of Newark, N. J., 1000
45. The FENTON Scholarship,  
founded by Aaron Fenton, 1000
46. The TRASK Scholarship,  
founded by Alanson Trask, of Brooklyn, 1000
47. The WITHINGTON Scholarship,  
founded by Chandler Withington, of Kingston, N. J., 1000
48. The NEWARK Scholarship,  
founded by the will of Henry Rogers, of Newark, N. J., 1000
49. The CARTER Scholarship,  
founded by Aaron Carter, of Newark, N. J., 1000
- 50-54. The HOLMES Scholarships,  
founded by Capt. Silas Holmes, of New York, 5000
55. The COLWELL Scholarship,  
founded by Stephen Colwell, of Philadelphia, 1000
56. The AITKEN Scholarship,  
founded by John Aitken, of New York, 1000
57. The BULLARD Scholarship,  
founded by Mrs. P. Bullard, 1000
58. The CHARLES DICKINSON HAMILL Memorial Scholarship,  
founded by his father, the Rev. Samuel M. Hamill, D.D., 1000
59. The CYRENIUS BEERS Memorial Scholarship,  
founded by his daughter, Miss Julia Beers, 1000
60. The JACOBUS Scholarship,  
founded by Peter Jacobus, of Newark, N. J., 1000

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|---|------|
| 61. The MATTHEW B. HOPE Scholarship,<br>founded by the Trustees as an acknowledgment of the<br>services of Prof. Hope in raising an endowment of<br>over \$100,000, | 1000 |
| 62. The JOHN MACLEAN Scholarship,<br>founded by a friend of President Maclean,  | 1000 |
| 63. The WHITE Scholarship,<br>founded by William White, Esq.,   | 1000 |
| 64. The ELIZABETH VAN CLEVE Scholarship,<br>founded by the Hon. C. S. Green, of Trenton, N. J.,   | 2000 |
| 65. The BLOOMFIELD Scholarship,<br>founded by the Hon. Amzi Dodd, of Bloomfield, N. J.,   | 1000 |
| 66. The FLAGLER Scholarship Fund,<br>The gift of Henry M. Flagler, of New York City,  | 1500 |
| 67. The JAMES MCCOSH Scholarship,<br>founded by friends of President McCosh in N. Y. City,  | 1000 |
| 68-69. The WISTAR MORRIS and CHARLES MORRIS WOOD<br>Scholarships, founded by their father, the Rev. Chas.<br>Wood, of Germantown, Pa.,                              | 2000 |
| 70. The CLASS OF 1856 Scholarship,<br>founded by members of the Class of '56,   | 1000 |
| 71. The CLASS OF 1841 Scholarship,<br>founded by members of the Class of '41,   | 1000 |
| 72. The ALBERT DOD BROWN Memorial Scholarship,<br>founded by his mother, Mrs. Susan D. Brown of<br>Princeton, N. J.,  | 1000 |

The above scholarships are for the benefit of students in the Academic Department, with the exception of the ELIZABETH VAN CLEVE Scholarship which may be assigned to a student in the School of Science.

About sixty scholarships were founded between the years 1853 and 1858, mainly through the efforts of President Maclean and Professor Hope. The last nine were founded since the beginning of the Academic year 1885-6.

### PECUNIARY AID.

The College has for many years remitted, on application, the tuition of candidates for the ministry, of the sons of ministers, and also of other applicants who present satisfactory testimonials of good moral character and of more than ordinary intellectual ability, with the assurance that the aid requested is absolutely needed. No candidate for admission to College who

is unexceptionable morally and intellectually will be refused admission because of inability to pay the charge for tuition.

In consequence of this liberal policy the amount of tuition remitted has increased until it is now more than double the entire income from the scholarship and charitable funds. If this policy is to be continued a large increase of these funds is urgently demanded. The Trustees have accordingly appointed a joint committee of members of the Board of Trustees and of the Faculty, to raise, if possible, for the object indicated, \$100,000. This effort is commended to the attention and favor of the Alumni and other friends of the College.

Although the charge for tuition, since the first scholarships were founded, has been advanced from \$60 to \$100, scholarships in the Academic Department for the benefit of candidates for the ministry, sons of ministers, or other students needing assistance, may be founded by the payment of \$1,000,—the scholarship to be designated as the donor may direct.

Applications for scholarships, or for aid from the charitable funds, should be made to Professor Duffield.

### EXPENSES.

The following is the Schedule of the College expenses for 1887-8 :

Board, 37 weeks.....	\$ 2.75 to \$7 per week.
Washing, 37 weeks.....	50 cents per week.
Tuition, Academic .....	100.00 per annum.
Tuition, School of Science .....	120.00 per annum.
Tuition, Special course in Analytical Chemistry .....	120.00 per annum.
Tuition, extra for Laboratory Chemistry, Senior elective .....	18.00 per annum.
Room rent (according to location of rooms)..	25.00 to \$200 per annum.
Fuel deposit (according to location of rooms)	17.00 to \$28 per annum.
Gas deposit (according to location of rooms)	24.00 to \$42 per annum.
Servants and Public Rooms (Library, Gymnasium, Museums, etc.).....	40.00 per annum.
Matriculation Fee, payable on entrance.....	5.00.
Graduation Fee, payable third term, Senior year .....	12.00.

For other special courses than that in Analytical Chemistry arrangement may be made upon consultation with the Professor in charge.

The charges for fuel and gas are approximations based upon the greatest amount used. An account of the actual consumption is kept with each room, and the exact charge is adjusted at

the end of the year. The charge for fuel includes the cost of kindling, and the labor of carrying coal, making fires, etc.

**Apparatus Deposits.**—Students pursuing certain courses in the School of Science are required to make deposits to pay for apparatus injured or destroyed. At the end of the term any excess in favor of the student is placed to his credit on the bill for next session. The deposits in the courses for B.S. are :— Sophomores, first term, \$12; second term, \$10; third term, \$5; Juniors taking any work in chemical analysis, second term, \$12; third term, \$8. Seniors electing the course in Chemistry and Mineralogy, first term, \$20; second term, \$15; other Seniors taking any work in chemical analysis, first term, \$15. The deposits in the course for C. E., all payable in the first term, are :— Freshmen, \$3; Juniors, \$6; Seniors, \$4; all of the foregoing being for apparatus in the Engineering Department; also, Sophomores, \$5 for the Engineering Department, and \$12 for blowpipe apparatus. Academic Seniors, electing Laboratory Chemistry, will deposit \$5, payable in the first term.

### ESTIMATES OF ANNUAL EXPENSES.

Attention is specially called to the following approximate estimate of the necessary annual expenses for a student occupying a room in College, without including clothes, travelling or vacation expenses :

	Min.	Medium.	Max.
Board, 38 weeks, at \$2.75 to \$7.00.....	\$104	\$152	\$268
Washing, 38 weeks, at 50 cents per week.....	19	19	19
Tuition and Fees.....	140	140	140
Room Rent.....	25	60	200
Fuel and Light (Kerosene or Gas).....	15	25	50
Books.....	15	20	25
Hall Dues and College Subscriptions.....	7	25	50
	<hr/>	<hr/>	<hr/>
	\$325	\$441	\$750
Deduct for Students on Scholarships .....	100		
	<hr/>		
	\$225		
Deduct for Candidates for Ministry.....	30		
See page 166.	<hr/>		
	\$195		

### College Bills.

All College expenses, including board and washing, must be paid in advance to the Treasurer of the College.



Students are required to call at the Treasurer's office in the course of the first ten days of each session, and to give information as to their place of boarding, etc., so that their bills can be made out. All bills must be paid within the first four weeks of the session. Failure to comply with this rule will deprive the student of the privileges of the College until payment is made, unless excused by special vote of the Faculty.

When a student enters College before the middle of a session, he shall pay in full the usual College charges for that session, with the exception of the charges for board and washing; if he enter after the middle of the session, he shall pay one-half. For board and washing he shall pay in proportion to the time.

When a student leaves the College, whether voluntarily or by dismissal, before the middle of any session, one-half of the charges for tuition and public rooms for that session shall be refunded. But in the case of temporary absence and subsequent return, although the absence be for more than half a session, no such rebate shall be granted.

When a student is dismissed from College for any cause, the advance deposit for board, washing, fuel and gas, beyond the time of his dismissal, shall be refunded to his parent or guardian.

When at the end of the first or second sessions the amount of the advance deposit proves to be in excess of the sum required to defray the board, washing or room bills of any student, the excess shall be credited on his bill for the next session. At the end of the College year the amounts overpaid for board, washing, room-rent, fuel, or gas shall be refunded by the Treasurer to the student's parent or guardian.

#### **RULES RESPECTING RENTAL AND ALLOTMENT OF ROOMS.**

1. Whenever a student desires to occupy a room in one of the College buildings, he and his parent or guardian shall be required to sign a room-agreement, engaging to pay the rent and charges of said room for the ensuing Academic year, or for the remainder of the current year, as the case may be.

2. The tenure of all rooms so engaged shall be subject to the following conditions as regards damages and repairs, viz. : (1.) All damage done to a room beyond the ordinary wear and tear, shall be made good as soon as possible at the expense of the occupant. This provision includes the breakage of glass whether by accident or design. The occupant shall employ the proper College workmen and pay the cost of the repairs at once to the Treasurer. (2.) The occupants of a room shall deposit with the Curator the sum of twenty-five cents for every key furnished, which amount shall be refunded on return of the keys.

3. Students now occupying rooms, or to whom rooms shall hereafter be allotted, may have the option of retaining such rooms until the end of their College course, on condition of annually notifying the Treasurer of their intention of retaining their room for the following year, and signing a new room-agreement before May 15th ; otherwise their rooms will be considered as vacated, and will be included in the annual allotment.

4. In the annual room-drawing, rooms shall be drawn only by the *bona fide* intending occupant. In case of absence through sickness, of any such intending occupant, a proxy duly authorized, in writing, may act in his stead. The student so drawing a room, either in person or by proxy, will be held for the rent of such room for the entire ensuing year unless released by the proper authority.

5. Rooms becoming vacant at or near the close of the College year shall be assigned to new occupants, by lot. The members of the Junior and Sophomore classes who desire a choice shall draw lots first ; then, the Freshmen. As soon as the drawing is completed the rooms must at once be selected in order of priority of choice.

6. No student will be entitled to the room allotted him unless the room agreements shall have been signed and returned to the Treasurer before June 5th.

7. New students shall have the choice of any remaining rooms in the order of their application, after admission into College, on condition of immediately signing the room-agreement, and depositing with the Treasurer the rent for the next ensuing term.

8. Every student who draws or retains a room is expected to occupy the same, and pay the rent and charges, or his share thereof, until the end of the College year, unless sooner released by the proper authority:

9. A student who expects to be absent on leave for a term may be released from the above obligation, by notifying the Treasurer before the beginning of the term, and by giving up the room; but no abatement or drawback for room rent will be made to any student vacating his room during a term, unless by express direction of the Faculty.

10. Whenever, by any contingency, one of two room-mates is permitted or obliged to cancel his room-agreement, the remaining occupant must vacate the room at the end of the current term, unless he agrees to pay the whole rent, or provides a room-mate who shall join him in signing a new agreement for the remainder of the College year. When one of two occupants of a room is a member of the Senior class, the room shall become vacant when the Senior graduates, and be subject to the provisions of Rule 5, except in cases where the joint occupancy has continued for at least one year.

11. When rooms are vacated during the first or second term the rent shall be paid to the end of the term (see Rule 9), at which time the students who may have registered their names as applicants for vacancies shall draw for them by lot.

12. Exchange of rooms, or substitution of one occupant for another, must be by authority of the Treasurer, and any student moving into a room, without authority previously obtained, will be liable to a fine of \$10, and be required to vacate the room. Such exchanges can only be made at the end of a term, or in the course of the first three days of the following term.

13. No tenant of a College room who is permitted or compelled to vacate such room will be allowed to transfer directly or indirectly any interest in or title to the room.

14. When a student vacates a room he shall immediately remove the furniture therefrom unless the student to whom the room is assigned elects to purchase the same. In case a sale is agreed upon between the parties, the price to be paid by the purchaser shall be ascertained by deducting from the cost price

of the furniture a discount of twenty per cent. per annum for the time the same has been in use by the vendor; provided that the price to be paid for the furniture in a room shall in no case exceed \$200. All sales shall be approved by the Treasurer before the same are finally consummated.

15. Students leaving College, or otherwise vacating their rooms, shall be allowed to store their furniture in a room assigned by the College authorities, under the charge of a salesman appointed by the College, where it may be offered for sale. Furniture remaining unsold at the end of three months, if not removed by the owner, will be disposed of at public auction to the highest bidder.

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## ALUMNI ASSOCIATIONS.

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### THE ALUMNI ASSOCIATION OF NASSAU HALL.

Founded 1826.

*President.*

Hon. ROBERT STOCKTON GREEN, LL.D., '50, Governor of New Jersey.

*Secretaries.*

Prof. JOHN T. DUFFIELD, D.D., '41.

Prof. HENRY C. CAMERON, PH.D., D.D., '47.

M. TAYLOR PYNE, LL.B., '77.

The annual meeting is held in the Old Chapel on Tuesday of Commencement week, at 1 P. M.; and the Alumni Dinner is given in University Hall at the close of the meeting. The membership includes all graduates and officers of the college.

**THE PRINCETON CLUB OF NEW YORK.**

Founded 1866.

*President.*

HENRY J. VAN DYKE, JR., D.D., '73.

*Secretary.*

RUDOLPH E. SCHIRMER, '80, 85 Union Square.

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**THE PRINCETON ALUMNI ASSOCIATION OF PHILADELPHIA  
AND VICINITY.**

Founded 1868.

*President.*

HON. BENJAMIN HARRIS BREWSTER, LL.D., '84.

*Secretary.*

GEORGE R. VAN DUSEN, '77, 6th and Locust Sts.

**THE PRINCETON ALUMNI ASSOCIATION OF THE DISTRICT OF  
COLUMBIA.**

Founded 1872.

*President.*

HARVEY LINDSLY, M.D., LL.D., '20.

*Secretary.*

JOHN H. VOORHEES, Esq., '41, Cor. 9th and F Sts., Washington, D. C.

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**THE PRINCETON ALUMNI ASSOCIATION OF WESTERN  
PENNSYLVANIA.**

Founded 1875.

*President.*

JAMES LAUGHLIN, JR., '68.

*Secretary.*

JAMES R. MACFARLANE, '78, Pittsburgh, Pa.

**THE PRINCETON ALUMNI ASSOCIATION OF CINCINNATI.**

Founded 1875.

*President.*

COL. JAMES W. ABERT, '88.

*Secretary.*

EDWARD H. ERNST, '82, Covington, Ky.

**THE PRINCETON ALUMNI ASSOCIATION FOR THE  
NORTHWEST.**

Founded 1876.

*President.*

SIMON J. MCPHERSON, D.D., '74.

*Secretary.*

WILLIAM B. MCILVAINE, Esq., '85, 97 Randolph St., Chicago, Ill.

**THE PRINCETON ALUMNI ASSOCIATION OF ST. LOUIS.**

Founded 1876.

*President.*

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*Secretary.*

CHARLES CLAFLIN ALLEN, '75, St. Louis.

**THE PRINCETON ALUMNI ASSOCIATION OF THE PACIFIC  
COAST.***President.*

Rev. A. WILLIAMS, '29.

*Secretary.*

FREDERIC E. SHEARER, '62, San Francisco, Cal.

**THE PRINCETON ALUMNI ASSOCIATION OF OMAHA.**

Founded 1884.

*President.*

Prof. C. M. DES ISLETS, '68.

*Secretary.*

LEONIDAS P. FUNKHAUSER, '78.

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THE PRINCETON ALUMNI ASSOCIATION OF KENTUCKY.

Founded 1884.

*President.*

THOMAS D. DAVIDSON, Ph.D., '48.

*Secretary.*

Prof. JOHN G. CECIL, '76, Louisville, Ky.

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THE PRINCETON ALUMNI ASSOCIATION OF CENTRAL  
PENNSYLVANIA.

Founded 1885.

*President.*

Hon. JOHN W. SIMONTON, LL.D., '50.

*Secretary.*

S. S. SCHULTZ, M.D., '52, Danville, Pa.

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THE PRINCETON ALUMNI ASSOCIATION OF LONG ISLAND.

Founded 1885.

*President.*

Prof. ROBERT FOSTER, '47.

*Secretary.*

Rev. N. WOOLSEY WELLS, '72, 155 So. 3d St., Brooklyn, N. Y.

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THE PRINCETON ALUMNI ASSOCIATION OF MARYLAND.

Founded 1885.

*President.*

Hon. CHARLES E. PHELPS, LL.D., '52.

*Secretary.*

HIRAM WOODS, JR., M.D., '79, 89 Franklin St., Baltimore, Md.

**THE PRINCETON ALUMNI ASSOCIATION OF NEW JERSEY.**

Founded 1886.

*President.*

Hon. EDWARD W. SCUDDER, '41.

*Secretary.*

CHARLES HEWITT, '83, Trenton, N. J.

**THE PRINCETON ALUMNI ASSOCIATION OF THE NEW  
NORTHWEST.**

Founded 1886.

*President.*

Gen. GEORGE B. HALSTED, '89.

*Secretary.*

WILLIAM W. CONNOR, '85, St. Paul, Minn.

**THE PRINCETON ALUMNI ASSOCIATION OF NORTHEAST  
PENNSYLVANIA.**

Founded 1886.

*President.*

FRANK B. HODGE, D.D., '59.

*Secretary.*

HENRY H. WELLES, JR., '82, Kingston, Pa.

**THE PRINCETON ALUMNI ASSOCIATION OF CLEVELAND.**

Founded 1887.

*President.*

Rev. WILTON M. SMITH, '77.

*Secretary.*

SAMUEL M. HAMILL, '80, Cleveland, Ohio.







